The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXVII, No. 24 CHICAGO, ILLINOIS DECEMBER 9, 1916

SPINAL FLUID FINDINGS CHARACTERISTIC OF CORD COMPRESSION *

JAMES B. AYER, M.D.
AND
HENRY R. VIETS, M.D.
BOSTON

On two consecutive days of October, 1915, our attention was forcibly called to the significance of certain changes in the spinal fluid characteristic of cord compression. Together we performed a necropsy on a man in whom the diagnosis was obscure, as shown by the term "myelitis," which had been the most satisfactory one obtainable. His spinal fluid had been examined by one of us a week previously; it was yellow, contained a fibrin clot, showed great excess of proteins by ammonium sulphate and alcohol precipitation, but only one cell could be found and the Wassermann and culture were negative. Necropsy showed compression of the cord by an extradural abscess. The very next day a patient came to operation because of increasing symptoms of transverse myelitis; he had previously had yellow fluid, increased proteins, increased cells and positive Wassermann; in him a dense fibrous thickening of the pia enveloping the spinal cord was found, sufficient cause for the symptoms of transverse myelitis.

On talking with colleagues at our own hospital, we found that a fluid characteristic of cord compression was not recognized by them; nor did we fare better on questioning physicians and surgeons of other Boston hospitals. Fearing local ignorance, a number of men in nearby cities most likely to see such fluids were approached; some had seen one or two yellow fluids which had greatly puzzled them, others had heard of them and not seen them.

On turning our attention to the literature, however, we were promptly rewarded by finding a number of articles, especially in French and German, dealing with this subject, and in these countries it was evidently recognized that there are certain changes in the spinal fluid characteristic of cord compression, colloquially referred to as the "spinal fluid compression syndrome." We have been able to find no collection of a series of cases illustrative of this subject in American journals, although a number of isolated case reports have been presented, occasionally with excellent discussion of the literature, particularly the articles by Mix.[1]

A group of twelve cases is here presented, all personally known to one or both of the writers, either from the laboratory or the clinical side, and usually from both points of view. All show the spinal fluid compression syndrome in its complete or incomplete form, and in all we have proof of cord compression, either from operation or necropsy, in one case only resting our proof on a combination of clinical and Roentgen-ray evidence. It has been hard indeed to exclude five other cases of similar nature, in which proof of the lesion or lack of personal knowledge of the case was lacking; suffice it to say, that this rejected group is in perfect accord with the twelve which are presented. Before proceeding to our own cases, however, let us examine the literature.

REVIEW OF LITERATURE

Abnormal findings in the spinal fluid, which have now become regarded as indicative of pressure on the spinal cord, were observed by Froin[2] in 1903. The spinal fluids from his cases showed three abnormal characteristics, a yellow color or xanthochromia, spontaneous coagulation, and an increase in the cell count. Three cases were reported at first and later one more.[3] Although no operative or postmortem findings are given, the histories of these patients would lead us to believe that the first was probably a pachymeningomyelitis of the conus terminalis, the second (?) tuberculous meningitis, the third Landry's paralysis, and the fourth syphilitic meningitis. From 1903 on, cases with these findings in the spinal fluid have been reported almost every year and Mix[1] in 1915, after a careful review of the literature, was able to find thirty-three and to add one case of his own. Since that time cases showing this complete syndrome have been reported by Demole[4] and Bromer.[5]

These thirty-six cases fall into three groups (1) the meningitis cases, (2) the cases showing pachymeningomyelitis of the conus terminalis, and (3) the cases of cord tumors. Under the first heading, meningitis cases, are found two of Froin's cases, one reported by Sicard and Descomps,[6] one of Froin and Foy's,[7] one by Verhoogen and Dustin,[8] one by Mestrezat,[9] one by Marinesco and Radovici,[10] one by Debré and Paraf,[11] and one by Bromer. Cases of Landry's paralysis reported by Froin, Donath,[12] and Braillon[13] also come into this

* From the Neurological Service, Massachusetts General Hospital and Departments of Neurology and Neuropathology, Harvard Medical School.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Mix: Clinics of John B. Murphy, 1915, iv, 317.
2. Froin: Gaz. d. hôp., 1903, lxxvi, 1005.
3. Froin: Aubry's Thèse de Paris, 1909.
4. Demole: Rev. neurol., 1915, xxviii, 648.
5. Bromer: Am. Jour. Med. Sc., 1916, cli, 378.
6. Sicard and Descomps: Gaz. d. hôp., 1908, lxxxi, 1431.
7. Froin and Foy: Gaz. d. hôp., 1908, lxxxi, 1587.
8. Verhoogen and Dustin: Soc. d. sc. méd. et nat. d. Brux., 1909, lxvii, 169.
9. Mestrezat: Liquide céphalo-rachidien normal et pathologique, Paris, 1912.
10. Marinesco and Radovici: Rev. neurol., 1913, xxv, 268.
11. Debré and Paraf: Presse méd., 1913, xxi, 952.
12. Donath: Wien. klin. Wchnschr., 1905, xviii, 1327.
13. Braillon: Gaz. d. hôp., 1909, lxxxii, 635.

first group. A typical example of this meningitis group is the case reported by Mestrezat:[14] Clinically there was flaccid paresis of the lower extremities of sudden onset with pain, loss of sphincter control, and with sensory and trophic changes. The spinal fluid one month after onset showed massive coagulation and xanthochromia and many lymphocytes. Necropsy showed extradural inflammatory neoformation at the level of the eighth and the ninth dorsal segments cutting off the end of the cord, with extension of inflammatory process to the leptomeninx.

The second group of cases is that best classified as pachymeningomyelitis of the conus terminalis, cases such as have been reported by Froin, Babinski,[15] Cestan and Revaut,[16] Fornaca,[17] Tedeschi,[18] Derrien, Mestrezat and Roger,[19] Claude,[20] Mestrezat, Marinesco and Radovici, and Launois, Frolin and Ledoux.[21] Some of these cases were without operation or necropsy, so that exact classification is impossible. One illustration of this group may be cited. The case of Launois, Froin and Ledoux is as follows: At first there was monoplegia, later flaccid paralysis, incontinence, Babinski, increasing paraplegia and death. The duration of the symptoms was four months. The spinal fluid formed a spontaneous clot with xanthochromia and lymphocytes. Necropsy showed chronic pachymeningtis with cutting off of dural cone at level of the conus terminalis.

The third group of the tumor cases all showed xanthochromia and spontaneous coagulation, but a variation in the cell count. Two examples of this group are as follows: In a case of Blanchetière and Lejonne,[22] a man of 66 had clinically spastic paraplegia. The spinal fluid finding showed yellow fluid, coagulation en masse, and few lymphocytes, found on seven punctures. Postmortem examination showed a tumor of the dura mater on the dorsal surface, at the seventh, eighth and ninth thoracic segments, not adherent to the cord. There was distinct compression of the cord, but no signs of meningitis. The duration of the symptoms before puncture was four months. A case reported by Klieneberger[22] was clinically a case of flaccid paraplegia. The spinal fluid findings showed increased pressure, amber color, spontaneous clot, increase in lymphocytes, on two punctures. On operation there was found a tumor of the fibers of the cauda equina and the anterior wall at the level of the second and the third lumbar vertebrae. A clear yellow fluid under pressure was seen below the tumor. The duration of the symptoms was about six months. Other cases in this group have been reported by Flatau,[24] Rindfleisch,[25] Collins and Elsberg[26] and Mix. All of these cases show xanthochromia and spontaneous coagulation.

Unlike the cases of meningitis there was only a slight cell count or none at all. This last fact was specially noted by Blanchetiere and Lejonne, who criticized the observation of Secard and Descamps, that all such spinal fluids were due to meningomyelitis. Mix also notes that the inflammatory compressions are the ones that give high cell counts. Thus he concludes that this characteristic is not a necessary part of the syndrome.

In regard to the cause of these findings there have been marked differences of opinion. Froin made no attempt to generalize. Cestan and Ravaut were the first to attempt to explain the xanthochromia and coagulation. They thought that the deep yellow color was due to the dissolution of the red blood corpuscles and consequent freeing of hemoglobin. The increase in albumin was due to the serofibrinous exudate of the inflammation. They even went so far as to think that a diagnosis of fibrinous hemorrhagic meningitis could be made from the spinal fluid findings. Sicard and Descomps believed that the inflammation was annular and caused vascular compression and the formation of a meningeal pouch below the point of constriction. As no tumor case had been reported up to that time they believed that the syndrome was always diagnostic of meningitis.

With the publication of the first tumor case by Blanchetière and Lejonne in 1909 the early theory of meningomyelitis as being the only cause had to be abandoned. These workers thought that the xanthochromia was derived from the hemoglobin. Klieneberger in 1910 believed that the tumors in his cases divided the spinal canal into two parts. Launois, Froin and Ledoux in 1914 came to the conclusion that the yellow color was due to local hemolysis or an exudation of the blood plasma. Mestrezat[27] concludes that "it is a transudation and perhaps sometimes little capillary hemorrhages in a closed pouch in the lumbar culdesac isolated in different ways from the remaining subarachnoid space, which brings about the syndrome of massive coagulation and xanthochromia."

It was soon noted that many cases of obvious spinal cord pressure due especially to tumors did not give a spinal fluid showing the complete syndrome of xanthochromia and coagulation en masse, with fibrin clot, but did show a marked increase in protein content, entirely out of proportion to the number of cells present. Nonne[28] in 1910 seems to have been the first to note this point and in that year he published a report of six cord tumors with spinal fluids of a pathologic nature. Nonne's cases did not show spontaneous coagulation as had the carefully reported case of Blanchetiere and Lejonne's, but all showed a very strong Phase 1 reaction with few or no cells. Three cases were verified by operation and two by postmortem examination.

The next important paper was one by Raven[29] from Nonne's clinic in 1912. Raven gives a careful review of the literature and reports fifteen cases, each showing an increase in proteins, and some showing spontaneous coagulation and xanthochromia. All these cases came to operation or necropsy and all showed a definite lesion causing compression of the spinal cord, the large majority being tumors. Raven also gives a table of forty-seven cases found in the literature, including his own fifteen and the six previously reported by Nonne. The focus of compression varied, eight being cervical, eighteen dorsolumbar, eight conus or cauda, and five diffuse. His conclusions are as follows:

Albumin increase with slight or no lymphocytosis indicates compression of the spinal cord. The cause of the compression cannot be determined by this test.

14. Mestrezat: Footnote 9, p. 432.
15. Babinski: Presse méd., 1903, xi, 755.
16. Cestan and Ravaut: Gaz. d. hôp., 1904, lxxvii, 985.
17. Fornaca: Gazz. d. osp., 1906, xxvii, 497.
18. Tedeschi: Gazz. d. osp., 1906, xxvii, 1067.
19. Derrien, Mestrezat and Roger: Rev. neurol., 1909, xvii, 1077.
20. Claude: Rev. neurol., 1909, xvii, 1420.
21. Launois, Froin and Ledoux: Gaz. d. hôp., 1914, lxxxvii, 361.
22. Blanchetière and Lejonne: Gaz. d. hôp., 1909, lxxxii, 1303.
23. Klieneberger: Monatschr. f. Psychiat. u. Neurol., 1910, xxviii, 346.
24. Flatau: Sektion d. neurol.-psychiat. Gesellsch z. Warschau, Nov. 19, 1910; Ztschr. f. d. ges. Neurol. u. Psychiat., 1911, iii, 146; Rev. neurol., 1911, xxi, 440.
25. Rindfleisch: Deutsch. Ztschr. f. Nervenh., 1904, xxvi, 135.
26. Collins and Elsberg: Am. Jour. Med. Sc., 1914, cxlvii, 493.
27. Mestrezat: Footnote 9, p. 448.
28. Nonne: Deutsch. Ztschr. f. Nervenh., 1910, xl, 161.
29. Raven: Deutsch. Ztschr. f. Nervenh., 1912, xliv, 380.

The increase of albumin occurs through stasis of fluid below the site of compression. Xanthochromia results from hemoglobin. Its presence strengthens the diagnosis. The syndrome may be found in cases of intramedullary tumors. The article is illustrated by two good colored reproductions of spinal fluids showing xanthochromia.

Later Raven[30] adds seven more cases to the fifteen already reported by him. In this paper he said that he was trying to find out the point of compression and the cause of compression, but this he was unable to do at that time. He reiterated his belief that a spinal fluid showing increased proteins and xanthochromia means compression at some point on the spinal cord. Nonne[31] in 1913 reported sixteen more cases, giving in detail the history of each patient with operative and postmortem findings and many exceptionally good photographs of the lesions. Many are tumor cases and the majority show increased proteins and some xanthochromia in the spinal fluids. Two cases are specially notable: His Case 3, gumma of the meninges in the dorsal region pressing on the spinal cord; the first lumbar puncture showed lemon color, Phase 1, triple plus, no lymphocytes and a positive Wassermann in both blood and spinal fluid. After intensive antisyphilitic treatment with clinical improvement the spinal fluid became clear and colorless. Phase 1, plus, showed no lymphocytes and Wassermann negative. In speaking of the value of lumbar punctures as diagnostic measures, Nonne says that these two punctures showed that there was compression of the spinal cord, that it was due to syphilis, and that the second puncture gave ocular demonstration of the improvement under treatment. Case 5 was osteoma of the tenth dorsal vertebra causing marked extradural compression. Clinically it was transverse myelitis. The spinal fluid was clear, Phase 1, triple plus, eight cells, Wassermann negative in both blood and spinal fluid. Three good illustrations of the cord are shown.

The following conclusions are drawn by Nonne:

1. The examination of spinal fluids seems to give us a compression syndrome by the increase in globulin with slight or no lymphocytosis, and either with or without a yellow color.

2. The increase of albumin in the spinal fluids in cases of tumor is probably due to stasis distal to the point of compression and not to inflammation.

The following diagnostic points are given:

1. Isolated increase of albumin in the fluid strengthens the suspicion of compression of the cord.

2. It is present only distal to the point of compression.

3. Xanthochromia of the fluid is due to mixture with blood coloring matter, probably in consequence of hemorrhage.

4. The syndrome gives no inference as to the character or starting point of the compression.

5. Spinal fluid results do not differentiate intramedullary and extramedullary growths.

Rare, isolated cases are found in the American and foreign literature, often reported without special attention to the spinal fluid findings. Such cases are those of Bassoe,[32] Schaller,[33] Assmann,[34] and Skoog.[35] Demole[4] in 1915 reported a case of carcinoma of the vertebrae metastatic from the breast, which showed massive coagulation and xanthochromia in the spinal fluid. Reichmann[36] in 1912 reported a case of von Recklinghausen's disease with multiple metastases in the spinal canal giving the syndrome of xanthochromia and increased proteins in the spinal fluid. Bromer[5] reported in 1916 a case of Pott's disease in the cervical region, the spinal fluid showing spontaneous coagulation and xanthochromia.

The literature may be summarized thus:

1. Abnormal findings in the cerebrospinal fluid in cases of cord compression was first noted by Froin in 1903. Since that date over fifty cases have been reported, mostly in the French and German literature.

2. The original syndrome of Froin consisted of xanthochromia, spontaneous coagulation with increase in the cell count. Other workers have shown that compression is also indicated by a low cell count, marked increase in protein content, with or without xanthochromia (Nonne and Raven).

3. The cause of compression may be tumors, Pott's disease, circumscribed meningitis, meningomyelitis, or any pathologic process causing complete or partial transverse myelitis from pressure, within or outside of the cord.

4. Compression may be exerted at any point on the spinal cord, but in the majority of the cases reported it was in the lumbar region or the conus terminalis.

5. The pathologic fluid was found only distal to the point of compression.

6. The cause of these findings is not known. It seems certain that in all of the cases reported there was the formation of a culdesac below the point of compression and it is in this walled-off space that the abnormal spinal fluid is found.

ANALYSIS OF PERSONAL CASES

1. *Characteristics of the Spinal Fluid.*—The one outstanding feature of the fluid in these cases is the marked increase of protein content. Normally, the spinal fluid contains a trace of proteins, as may be demonstrated by precipitation with alcohol; the fluid in cases of chronic inflammation of the meninges, such as tabes, shows slight increase, as demonstrated by alcohol, ammonium sulphate (Nonne), butyric acid (Noguchi) and other tests. The increase in these cases is usually many times that of the tabetic fluid.

That this increase of proteins is not dependent on an inflammatory process is evident from the fact that cells are either absent or in negligible quantity, and when found, are frequently endothelial in origin and not exudative in type; in two cases, in which a definite lymphocytosis occurred, the constrictive process was shown to be syphilitic. Interesting in this connection is Case 8, in which we have spinal fluid examinations before and after the appearance of symptoms of compression; with no more evidence of inflammation we see a marked increase in the protein content.

Xanthochromia occurred in just half of our cases, the color varying from the palest yellow tint to a deep yellow. The remaining six cases showed clear, colorless fluids, to the eye apparently normal. In one patient, in whom consecutive punctures were made, we were able to follow the fluid in its transition from colorless to yellow and to colorless again after operation. Whether colorless or xanthochromic, the fluids were invariably clear, with the exception of fibrin clots, which formed spontaneously in four of the most deeply yellow fluids.

30. Raven: Deutsch. Ztschr. f. Nervenh., 1913, xlix, 36.
31. Nonne: Deutsch. Ztschr. f. Nervenh., 1913, xlvii, 436.
32. Bassoe, J.: Nervous and Mental Diseases, 1915, xlii, 736.
33. Schaller: Jour. Nerv. and Ment. Dis., 1913, xl, 489.
34. Assmann: Deutsch. Ztschr. f. Nervenh., 1910, xl, 131.
35. Skoog: Spinal Cord Compression from Leptomeningeal Cysts, THE JOURNAL A. M. A., July 31, 1915, p. 394.

36. Reichmann: Deutsch. Ztschr. f. Nervenh., 1912, xliv, 95.

Pressure, as tested by manometer, was invariably within normal limits, tending toward low readings. An additional argument that there exists a closed cavity below the level of constriction is given in Case 6; this patient had brain tumor with beginning choked disk and should have had high spinal fluid pressure, 400 mm. or more; his pressure was normal, 170 mm. It is reasonable to assume that the tumor, which also constricted the cord, had shut off the lower from the upper spinal canal.

The Wassermann reaction was negative in all except three cases, two of these undoubtedly syphilitic.

The colloidal gold test of Lange was performed in eleven cases. In seven the greatest color change appeared in the maximum dilutions, the so-called tumor zone. In one it was in the syphilitic zone, and in three there was a slight color change in all dilutions. In two patients in whom goldsol reactions were performed at different times the maximum change was seen to occur in progressively greater dilutions as the clinical picture of transverse myelitis became more marked, this change going hand in hand with increase in proteins.

Culture was negative in one case of epidural abscess, thus showing what an important barrier the dura presents to infection by direct extension.

cases fall in the dorsal region, as is to be expected from its relatively greater length and variety of pathologic processes involved.

Concerning the aspect of the cord on which compression is chiefly exerted, we find pressure from the side, from back, from front, constriction from all sides and pressure from within; in fact, every aspect imaginable.

3. *Probable Duration of Compression.*—In these cases this was as varied as the pathologic process and the location and aspect of the compressing agent. For the most part, however, they fall into two groups: compression from acute processes, such as extradural abscess leading to rapid paralysis, and compression from chronic processes, causing insidious symptoms. All, however, produced spinal fluids which gave the syndrome, complete or incomplete.

A glance at Table 1 will give a concise idea of the above facts, and will help to understand the subsequent discussion. Intensity of symptoms is shown by a plus sign, depending on the degree of disability, both motor and sensory, exhibited at the time of puncture. Spinal fluids are classed as forming the complete or incomplete syndrome, depending on whether they exhibit xanthochromia or not. The arrangement is topographic from cervical to sacral downward.

TABLE 1.—DATA OF AUTHORS' CASES OF CORD COMPRESSION, ARRANGED IN SUCCESSION FROM HEAD DOWN

Case No.	Spinal Fluid Syndrome	Compressing Agent	Location and Aspect of Compression	Duration of Compression	Intensity of Symptoms
10	Incomplete	Dermoid cyst of cord	Cervical 4 and 5, central pressure	6 years	+++
3	Incomplete	Tuberculosis of vertebra	Cervical 6 and 7, ventral pressure	4 weeks	++
5	Complete	Intramedullary tumor	Cervical 7, central pressure	7 years	++
9	Complete	Chronic progressive fibrous leptomeningitis (syphilitic)	Diffuse; all sides upper dorsal	1 month	+++
7	Incomplete	Intramedullary tumor?	Dorsal 4, central pressure	13 years	+
1	Complete	Epidural abscess	Dorsal 4 and 5, dorsal pressure	1 week	+++
6	Complete	Glioma of meninges	Diffuse, all sides, mostly dorsal	4 months	+++
2	Incomplete	Extradural endothelioma	Dorsal 6, dorsal pressure	1½ years	++
11	Complete	Epidural abscess	Dorsal 4 to 7, dorsal pressure	2 weeks	+++
8	Incomplete	Charcot spine	Dorsal 11 and 12, lumbar 1 and 2	14 weeks	+
12	Complete	Varix of cord	Sacral, central pressure	5 years	++
4	Incomplete	Fibroma	Cauda equina	4 to 6 years	+

To sum up, all fluids showed increased proteins, all except one greatly increased. There was no evidence of acute meningeal irritation in any and there was evidence of slight chronic irritation, as shown by mild lymphocytosis, in two only. Half of our cases showed the yellow color and four of these exhibited the full characteristics of the original *syndrome de coagulation massive et de xanthochromie* of the French. The remaining six fluids are, however, pathologic only to a less extent, and are characteristic of cord compression, though less strikingly so. Pressure of spinal fluid was essentially normal in all tested cases. The Wassermann reaction was strongly positive only in syphilitic cases. The goldsol reaction usually fell in the tumor zone, with marked change of color in the greater dilutions.

2. *Constricting Agent.*—Even in this small group we find many different types of causes and degrees of constriction. We have agents causing compression for a week and for years; we have pressure caused from outside of the dura, from inside of the cord and from affection of the meninges themselves. We have acute inflammations and chronic inflammations; we have rapidly growing tumors and benign tumors.

Again, we find that our series shows constriction of nearly every segment of the spinal cord, and even a tumor below the cord is found to give the characteristic spinal fluid picture. By far the greater number of

COMMENT

Can we go farther than to differentiate two general varieties of spinal fluid indicative of cord compression? Can we deduce anything of more minute diagnostic value from the study of even these few cases?

It seems to us that we can. One point seems certain, pressure sufficient to cause marked sensory and motor disturbance tends to give the complete spinal fluid syndrome. The one exception was Case 10, in which the locus of pressure was the highest in the series; and this leads to the second point, that in cases in which symptoms of compression were marked, the lower loci of compression more frequently gave the stronger positive fluids. Compression from acute processes was more potent in the production of yellow fluids than that from chronic causes, and, lastly, it seems that intramedullary and meningitic lesions, especially when surrounding the cord completely, are more productive of the complete syndrome than are extradural processes.

It seems reasonable at this point to take into consideration five other cases which have come to our attention, which could not, for lack of proof, be used before; all are clinically cord pressure cases, and one proved by necropsy (case of Dr. Charles A. McDonald of Providence); four of these five had punctures from forty-eight hours to six weeks after onset of symptoms; all gave the complete spinal fluid picture. The

TABLE 2.—SYMPTOMS, FINDINGS, TREATMENT AND RESULT IN AUTHORS' CASES OF CORD COMPRESSION

Case Number and Condition Present	Symptoms and Signs	Spinal Fluid	Result
1. Pressure on cord from extradural abscess	Complete transverse myelitis, middorsal; one week	Yellow, clear, with fibrin clot; coagulable proteins greatly increased; cells 0; pressure normal; culture negative; goldsol meningitis	Necropsy. Pressure on D. 4 and 5 segments, posterior and lateral, by pus, extradural
2. Progressive paralysis from extradural endothelioma	January, 1914. Brown-Sequard syndrome, 8 weeks' duration. Probable diagnosis, syringomyelia	Colorless, clear; proteins much increased; cells 8; Wassermann negative; goldsol: 0, 0, 1-2, 2, 2, 3, 2, 2, 1, 0	
	December, 1914. Increase of symptoms, approaching transverse myelitis. X-ray of spine negative	Colorless; proteins much increased; cells 1; Wassermann negative; pressure 150 mm.; goldsol: ±, 1, 2, 2, 2-3, 2-3, 1, ±, 0, 0	
	August, 1915. Partial transverse myelitis at D. 4. Unable to walk. Double clonus and Babinski, more marked on right	Colorless; proteins much increased; cells 5; Wassermann negative; pressure 210 mm.; goldsol: 0, 0, 0, ±, 1, 1-2, 1-2, 1, ±, 0	Aug. 16, 1915. Operation. Endothelioma extradural, size of English walnut pressing on D. 6 and attached to dura on right. Erosion of lateral wall of vertebral canal into base of 4th D. spine. Tumor removed entire, dura incised, with escape of clear fluid. Complete recovery of patient
3. Pressure from Pott's disease	July, 1914. Partial transverse myelitis, 4 weeks. X-ray shows distinct difference in articulations of lower cervical vertebrae	Colorless; proteins much increased; cells 26; Wassermann negative; goldsol: 0, 0, 0, ±, 1, 3, 3, 5, 4, 2; culture negative	Operation. Cord bulging of anterior wall of spinal canal caused by extradural tubercular abscess. Improved
4. Fibroma of cauda equina	September, 1915. Pain and paralysis of legs, without loss of sphincters or sensory disturbance characteristic of transverse myelitis; slowly progressive	Colorless; proteins much increased; cells 40; Wassermann negative; goldsol: 0, 0, 0, ±, 2, 3, 3-4, 3, 2, 1; pressure 110 mm.	First operation, no tumor found (too low). Second operation, fibroma found on one part of cauda equina, molded to the shape of spinal canal
5. Intramedullary tumor	Illness began 7 years ago with pain in left arm which became, 4 years ago, replaced by numbness; later, stiffness of legs. X-ray showed distinct atrophy of 7th cervical vertebra	Yellow; proteins much increased; Wassermann negative; goldsol: 0, 0, ±, 1, 1, ±, 1, 2, 3, 2; pressure normal	Operation. Swollen, discolored cord at C. 7 level. Diagnosis, intramedullary tumor. Partial benefit
6. Glioma of brain; extension to spinal meninges	Marked ataxia of legs of few weeks' duration, rapidly progressive to motor and sensory paralysis with upper level at D. 8. Optic neuritis, developing into choked disk, and symptoms of increased intracranial pressure. X-ray of spine and cranium negative	Oct. 21, 1915. Yellow; no clot on standing; proteins much increased; cells 11; Wassermann negative; goldsol: 1, 1, 1, 1, 1, 1, 1, 1, 1, 1; pressure 170 mm.	Nov. 9, 1915. Operation. Subtemporal decompression; no tumor found
		Nov. 17, 1915. Slightly yellow; cells 4; goldsol: 0, 0, 0, 0, 0, ±, 1, 1, ±, ±	Nov. 17, 1915. Necropsy. Glioma at base of brain, and also extending up and down cord for greater part of its length, between membranes, most marked and entirely surrounding cord in dorsal region
7. Intramedullary disease (?)	For 13 years increasing paresthesia of fingers and, later, feet. Recently cutaneous sensory disturbance to level of upper dorsal. X-ray negative	Colorless; proteins moderately increased; cells 0; pressure normal; goldsol: 0, 0, ±, ±, ±, 0, 0, 0, 0, 0; (Wassermann blood and fluid negative previously)	Operation. Discolored cord at D. 4. Cord not enlarged
8. Charcot spine	1913. Typical low tabes of 2 years' duration. Treated with salvarsan and mercury, without change	Colorless; proteins slightly increased; cells 78; pressure 60 mm.; Wassermann negative (later positive); (Wassermann blood positive)	
	1915. Cutaneous sensory disturbance with Babinski. Knuckle of lumbar spine noted for first time. X-ray showed fusiform swelling about and involving high lumbar vertebrae	Colorless; proteins greatly increased; cells 21; Pressure 100 mm.; Wassermann strongly positive; goldsol: 0, 0, ±, 2, 2, 2, 3, 1-2, ±, 0	Plaster cast gave partial relief
9. Chronic progressive syphilitic leptomeningitis	1908. Treated for syphilis of nose. 1913. Left 6th nerve palsy, 6 months' duration, with pains in legs and unsteadiness. Argyll Robertson pupils, but normal reflexes. Improved under salvarsan	Colorless; cells 10; Wassermann negative; (proteins not examined)	
	March, 1914. Better.....	Colorless; cells 44; Wassermann positive; pressure 160 mm.; (proteins not examined)	
	August, 1914. Complains of pain about shoulders and stiffness in walking	Yellow, clear; proteins much increased; cells 1; Wassermann anticomplementary; pressure 110 mm.	
	Sept. 21, 1914.....	Yellow, clear; proteins much increased; cells 1; pressure 160 mm.; Wassermann anticomplementary; goldsol: 0, 0, 4, 4, 4-5, 5, 5, 5, 5, 5	
	Oct. 1, 1914.....	Slightly yellow, clear; proteins much increased; cells 11; pressure 170 mm.; Wassermann anticomplementary; goldsol: 0, 1, 2, 2, 2-3, 3, 3-4, 3, 3, 1	
	Nov. 7, 1914. No change in condition clinically. Clearly spastic paraplegia with diminished cutaneous sensation below nipples	Yellow, clear; proteins much increased; cells 5; pressure 150 mm.; goldsol: 0, ±, 1, 2, 2, 2-3, 3, 3, 2, 1	
	December, 1914. Same. Babinski and clonus both sides. Atrophy shoulder girdles		
	July 16, 1915. Condition same.....	Colorless; proteins moderately increased; cells 5; pressure 90 mm.; goldsol: 0, 0, 0, ±, 1, 1, 1, ±, 0, 0	Oct. 8, 1915. Operation. Extensive dense fibrous leptomeningitis encasing cord posteriorly and laterally in upper dorsal region, extending above and below laminectomy opening. Incised but cannot be removed
	Oct. 23, 1915. Condition about same.....	Bright yellow; proteins much increased; cells 3; pressure 170 mm.; goldsol: 0, 0, 0, ±, ±, ±, 1, 2, 2, ±	
	Feb. 10, 1916. Same. Perhaps a little improvement in motion and sensation	Colorless, clear; proteins moderately increased; cells 4; pressure 100 mm.; goldsol: 0, 0, 0, ±, 1, 1-2, 3, 3, 3, 2-3	
10. Large dermoid cyst of cord	March, 1916. Pain in arms for 6 years. For one year weakness of legs and numbness of arms and legs; marked spastic gait with crutches. Cutaneous sensory change to C. 4	Colorless, clear; proteins slightly increased; cells 1; Wassermann negative; goldsol: 0, 0, 0, ±, 1, 1, ±, 0, 0, 0	Operation. Dermoid cyst, apparently arising from and markedly distorting the spinal cord at C. 4 and 5. May 3, able to stand and walk a little better
11. Pressure on cord from extradural abscess	Feb. 18, 1916. Pain in left shoulder and chest 2 weeks. Retention 5 days. Spastic paraplegia 4 days. Temp. 101 to 105. Hyperesthesia. D. 7 to 9. Anesthesia below D. 9	Yellow, clear; fibrin clot; protein greatly increased; cells 0	Operation. Epidural abscess pressing on cord, D. 4 to 7. Culture from pus shows Staphylococcus aureus. Death; no necropsy
12. Varix of posterior spinal veins of sacral cord	Pain in spine, back and legs 5 years. Disturbance sphincters 1½ years. April 25, 1916. Knee jerk, left greater than right. Ankle jerk not obtained. Plantar reflexes normal. Atrophy right leg with toe drop. Sensation normal	Bright yellow, clear; fibrin clot while needle in situ; protein much increased; pressure not increased; cells 4; Wassermann negative; goldsol: 0, 0, 0, ±, 1, 1-2, 3, 3-4, 4, 5	Operation, May 1, 1916. Cord seemed to be under pressure and forced outward on opening dura. Veins of sacral cord greatly dilated at first, but normal after few minutes. No other abnormality. Patient improved

fifth case shows little disability, but symptoms are referable to the lumbar cord; the fluid in this case also is yellow.

In line with our finding of incomplete fluids as a result of extradural pressure from chronic processes is the only case which we have had which failed absolutely to give positive findings. This patient gave the clinical picture of transverse myelitis in moderately complete form, with level at dorsal 5 to 7. Operation revealed myeloma of the vertebra, with extradural pressure on the cord. This is in agreement with Nonne, who found negative fluids in a few cases with evident cord pressure. On the other hand, in upward of 1,000 punctures we have not found the syndrome in other than cases of cord compression. While, then, we must admit that spinal cord compression may be present without causing changes in the spinal fluid below the pressure level, the fact seems to be that the characteristic changes usually occur, and that we can reasonably expect to find the spinal fluid syndrome in its complete form in cases in which symptoms of pressure develop rapidly, especially if the compressing agent is within the dura and the pressure is exerted on the lower part of the spinal cord.

CONCLUSIONS

1. We believe that changes in the spinal fluid frequently occur as a result of compression of the spinal cord.

2. The principal characteristic of such compression fluid is marked increase of proteins without corresponding cellular increase, obtained under normal pressure.

3. Xanthochromia with massive coagulation added to the above makes a more intense reaction of the same significance, only more conclusive.

4. Factors which tend to give the syndrome most readily, or to give it in its most intense form, are processes which act rapidly, are intramedullary or cause pressure on the cord from all sides, and which affect the lower cord.

5. We do not believe that such findings are necessary in cord compression, but that their presence is confirmatory evidence of value in some cases.

ABSTRACT OF DISCUSSION

DR. PETER BASSOE, Chicago: In an article by Dr. Charles L. Mix on massive coagulation and xanthochromia it is shown that this syndrome is not characteristic of either inflammation or tumor, but of the formation of a meningeal pouch in the lower part of the spinal canal. Dr. Mix insists that only cases in which the fluid coagulates massively, so the tube can be turned upside down without spilling, should be included. In a recent case of sarcoma of the cord in the thoracic region I repeatedly obtained a uniformly yellow fluid which coagulated spontaneously but not massively.

DR. FRANCIS A. ELY, Des Moines, Ia.: Within the past six months I have had the opportunity of studying the cerebrospinal fluids in two cases. The first case was that of a young man who came into the hospital with symptoms which led to a provisional diagnosis of laminated cervical meningitis although there was marked loss of sensibility to pin prick and temperature discrimination. The predominance of tearing bilateral symmetrical pains in the distribution of the median and ulnar nerves and the marked loss of sensibility to cotton wool led me temporarily astray from the proper diagnosis. Fearing that I might be overlooking an intramedullary tumor the patient's consent to a cervical laminectomy was secured, and at operation the dura was observed to be nonpulsating and the cervical cord to be greatly swollen and distended. A subsequent necropsy revealed an extensively tubulated syringomyelic cord. The cerebrospinal fluid obtained by lumbar puncture when the patient first entered the hospital exhibited the xanthochromic syndrome and the fluid obtained from the cavity within the cord was found to have the same characteristics. The other case was one of posterior fossa tumor probably primary in the cerebellum and growing into the pontine angle, in which the cerebrospinal fluid also exhibited the yellow color, strongly positive Noguchi, low cell count, and negative Wassermann. In this case no evidence of compression of the cerebrospinal axis below the foramen magnum could be obtained.

DR. A. L. SKOOG, Kansas City, Mo.: I have had similar experiences with cord compression cases due to several different causes. Perhaps the most interesting cases I have observed during the past ten months are two psammomas, both of them growing from the inner surface of the dura and both involving the middorsal region. One had existed, judging from the clinical history, for a period of nine years, the other for about two years. Pathologically the tumors showed a difference owing to their age, the older one being much more dense and having a heavy capsule. The operation demonstrated that they had been localized correctly, and they were removed successfully. One of them showed a mild xanthochromia, the other not. Both of them had a greatly increased protein content in the spinal fluid. They were negative to Wassermann and gold colloid tests for syphilis. One interesting finding on which I lay a great deal of stress, and which I believe should be added to the syndrome, is the state of pressure of the cerebrospinal fluid. For instance, the first patient cited had in the sitting posture a spinal fluid pressure of only about 40 mm., while the normal pressure is in the neighborhood of 120. After withdrawing, allowing it to drop away, not more than 3 c.c., the pressure was reduced to nil. The second patient, again in the sitting posture, at first had a spinal fluid pressure of about 55 mm. (measured by the water-gage apparatus). After removing about 5 c.c. the pressure in this case also was reduced to nil. The first patient had no lymphocytosis. The second patient, the one most recently operated on, had a lymphocyte count of 9.3 per cubic mm. In cerebrospinal syphilis there is practically always increased pressure. I know of but one exception in my experience, and at necropsy it was demonstrated that the choroid plexus was practically destroyed, which explained the subnormal spinal fluid pressure. I think that nine tenths of the choroid plexus cells had been destroyed, but he had marked evidences of cerebrospinal syphilis.

DR. ERNEST SACHS, St. Louis: About two years ago I had a case of fibroma of the spinal cord, the patient having had symptoms for about four years. At the end of the first two years he was completely paralytic, had lost all power in the legs and had complete loss of sensation to the eighth dorsal segment. Following this he recovered the use of his legs to a slight extent. They became very spastic, and still he was bed-ridden. At the end of four years he came to me. The spinal fluid showed the characteristic picture of xanthochromia. It did not coagulate, and we made a diagnosis of spinal cord tumor at the level of the eighth dorsal segment. The two interesting points in the case were, first, that after withdrawing about 3 c.c. of yellow fluid, we were unable to obtain any more; second, that the tumor symptoms had receded, which was explained at operation by the fact that histologic examination of the tumor indicated that at one time it was very vascular but had contracted. As to the statement that xanthochromia is produced by complete compression of the cord, this case would seem to throw some doubt on that conclusion, since the tumor, having contracted, occupied less space in the spinal canal than had been the case originally. I would like to ask Dr. Ayer whether in any of his cases a second puncture yielded yellow fluid. In this case a second lumbar puncture showed no fluid whatever, and following operation the spinal puncture yielded normal cerebrospinal fluid. I think that the yellow color must be due to blood pigments. I do not see why a transudation should give a yellow color unless the color is imparted by some degeneration of the hemoglobin.

DR. CHARLES R. BALL, St. Paul: In my experience xanthochromia is not confined to cord lesions, but in quite a number of cases that have come under my observation I have found

it in lesions of the brain proper. This has been observed by me in a number of cases of severe apoplexy where two or three weeks afterward there was a very distinct yellowish tinge to the cerebrospinal fluid. Also in two cases of cerebrospinal syphilis there was very marked xanthochromia. These cases afterward cleared up under specific treatment. In the cerebral lesions, and in the cases of cerebrospinal syphilis, however, the cell count was quite large, so that the compression syndrome which Dr. Ayer describes in his paper was not present. In deciding on the diagnosis of spinal cord compression this syndrome to which Drs. Ayer and Viets have called attention is a very important one. I would have much more assurance in advising a decompression by laminectomy when it is present. It is well for us to keep in mind that xanthochromia may be found in both brain and cord lesions.

DR. W. F. LORENZ, Mendota, Wis.: I concur that xanthochromia does not necessarily indicate a case of spinal cord compression. In two cases that came to necropsy a focal lesion was found, and the condition was evidently the result of former hemorrhage.

DR. CHARLES A. ELSBERG, New York: Up to the present time we have been unable to discover anything characteristic in the spinal fluid in spinal cord tumor. In thirty cases of extramedullary spinal cord tumor that I have operated on there was xanthochromia in six, but five of these six cases were tumors of the conus and cauda equina, the other was a tumor in the lower dorsal cord. In a considerable number of my patients there was neither an increase of globulin nor an increase in the number of cells, nor anything else abnormal. In other words, in at least one third of them the spinal cord fluid was absolutely normal in every respect. In the absence of abnormalities in the spinal fluid, therefore, there may nevertheless be pressure on the spinal cord. On the other hand, however, I have seen three cases of tumor near the cerebral ventricles, in which aspiration of the ventricle yielded a yellow fluid; in all three patients lumbar puncture also yielded a yellow fluid. Two of the cases came to necropsy, and were proved to be large tumors near the third ventricle. The third case, which did not come to necropsy, was operated, and the tumor was found. I do not believe, therefore, that the findings described by Dr. Ayer are absolutely characteristic of spinal cord tumor, although frequently present.

DR. JAMES BOURNE AYER, Boston: One of the speakers stated that xanthochromia occurred in other conditions, as tumors of the brain. I do not doubt it, but xanthochromia is not the syndrome. It is xanthochromia plus the other findings. We have had two cases showing yellow color, but with only very limited increase in proteins, one with many red blood corpuscles, the other with polynuclear leukocytes, both of which were unlike the fluids of cord compression. Dr. Elsberg is very skeptical in regard to the use of this syndrome. It is in differentiating certain other organic conditions affecting the spinal cord which may or may not be cord tumor, seen rather by the neurologist than by the surgeon, in which I take it the importance of this syndrome lies. We have not as yet found any cases of this particular syndrome either complete or incomplete, from brain conditions. On the other hand, we have one case, and doubtless will have more, as is the experience of Elsberg, Nonne and others, of cord compression from tumor with absolutely negative findings. What we recommend is to use this syndrome in connection with, and only in connection with, clinical findings, laying stress chiefly on positive findings. Dr. Skoog mentioned pressure, and I should have said more about the pressure. We measured the pressure in practically every case, and it was almost invariably normal. In one case the pressure was normal in spite of the fact that the patient had, besides his cord tumor which constricted the dorsal region, a brain tumor, which should have given a high pressure reading 400 mm. or more. This patient had 170 mm. pressure, which with our technic has been found to be normal. Dr. Ely's cases are exactly what would be expected. Syringomyelia certainly acts like tumor of an intramedullary nature. Dr. Mix's analysis was one of the best I have seen. But he does not seem to go any farther than did Mestrezat three years earlier; that is, he says the complete syndrome is necessary to be of clinical significance. But if we wait until then, I think in some cases we will have lost our chance; we have to use the incomplete syndrome in helping us to make an early diagnosis of compression. In one case in which we had a series of punctures, the first one showed the syndrome in incomplete form. Operation was considered, but thought premature. A year and a half later the patient showed increase of symptoms, with increased intensity of the fluid syndrome; operation was then performed, and a tumor removed. It would have been done earlier had the significance of the incomplete syndrome been appreciated.

MUNICIPAL HEALTH ADMINISTRATION *

ERNEST C. LEVY, M.D.
Chief Health Officer
RICHMOND, VA.

So numerous and so excellent have been the papers on municipal health administration which have been presented before this Association and the American Public Health Association in the past few years and published in their respective organs, to say nothing of other able papers presented elsewhere, that it is scarcely possible to improve on work already so well done.

And hence, in accepting the invitation of our Chairman to discuss this subject before the Section on Preventive Medicine and Public Health, I did so with the distinct understanding that I might depart entirely from the usual method of presentation, the method followed in the splendid papers to which I have just referred, that I would not have circles and squares and connecting lines, or text of the kind which goes with such diagrams.

There is, it seems to me, one important phase of municipal health administration which may be profitably discussed at the present time. Following the suggestion in the address of our Chairman, I will at the outset state the idea which I wish to present for your consideration.

Sanitary science has advanced so rapidly within the past few years that no municipal health department can possibly do more than a very small proportion of those things which we know how to do, because we are held down in our appropriations and limited in the exercise of authority.

The next point is that conditions differ so greatly in our cities that the relative importance of the various problems of public health, as well as the methods by which these problems can best be dealt with, must also differ. In consequence of this, each health officer must formulate a working program of public health especially adapted to his own community, in order that he may devote his limited funds to those things which will bring the best returns; so that, just as he gets increased appropriations and increased powers, he may use them so as to accomplish the maximum amount of good.

In the preceding two paragraphs I have stated the theorem which I wish to discuss here today.

The development of sanitary science and of the practical means whereby we can give to the people the benefits of that development has been so tremendous in recent years as to be almost appalling. I am sure that every member here present who has tried to keep himself informed is conscious of the fact that there

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

has been an immense broadening of our conceptions of public health work within the past two or three years; that we look on its possibilities today as tremendously more far-reaching than we did even that short time ago.

It is literally true that from the time a person gets up in the morning until he gets up next morning there is scarcely an act of his that has not its bearing on the health of that individual. And so we may look through the wide range of municipal activities and find that in every one of them the health of the community is in some way, directly or indirectly, involved.

But obviously no normally constituted person is going to give the consideration of health first place in everything he does. Equally obviously, no sane health officer would advocate the taking over of every municipal activity by the department of health, even though there be in every one of them a health element of one sort or another. In consequence of this it has long been recognized by health officials that there should be closer agreement as to what municipal activities should properly be under the department of health.

In a general way this is unquestionably desirable. But I wish to make it very plain that this is quite a different matter from attempting to formulate a standard plan of work for municipal departments of health. Indeed, to show that such a standard plan is neither desirable nor feasible is the chief contention of this paper.

Communities differ greatly in many fundamental conditions which affect profoundly the actual value and the relative importance of various health policies, and any attempt to work out a standard program for municipal health departments must result only in failure.

It is unnecessary to go into an exhaustive analysis of all the diversities which make it impracticable and undesirable to work out a standard plan for the organization and administration of city health departments. The most important of these diversities are the following:

Size.
  Area.
  Population.
Location.
  Geographic.
  Topographic.
Industries.
Character of population.
  Racial.
  Habits and customs.
  Language.
  Age distribution.
  Stability (immigration, floating population, etc.).
Stage of development of health work.

The above list is not presented as complete. It is merely suggestive. Moreover, in many instances the topics overlap each other. Climate is dependent on location, both geographic and topographic, while both climate and location are important factors in determining the nature of industries, as is also the nature of the population. On the other hand, the nature of industries already established is a factor in further determining the nature of the population. Illustrations of such interaction are almost numberless.

Discussion of the factors given in the above list will not be entered into further than to illustrate the point which I wish to establish.

First, let us consider the size of the community. Were any argument needed to prove its importance it would be found in the fact that before we can intelligently discuss the subject of municipal health administration we must have it distinctly understood that no general plan of organization applies to our greatest cities, our large cities and our smaller ones.

Climate is of immense importance. In northern cities scarlet fever and diphtheria have far greater relative importance than in southern cities. In southern cities typhoid fever, malarial fever, hookworm, yellow fever, all intestinal diseases and everything affecting infant mortality have relatively more importance than in northern cities.

Topographic location is highly important. Nearness to a large stream or lake bears directly on the question of water supply, as does also the nearness and size of other communities upstream. The health work in a city, especially a southern city, located near swampy, low lands must differ decidedly from the health work of a city only a few miles away, but in the mountains.

As a simple illustration of the effect of topography, a city of a given size located on the seashore or on a great lake has to draw on a radius of seventy miles for its milk supply, while an inland city of the same size has to go only fifty miles to draw on an equal land area. One draws on only a semicircle; the other on a circle. This has a direct bearing on the quality of the milk supply, and hence on health, since it affects the freshness of the milk and modifies the work of the dairy inspector. The same principle applies to other fresh products of the farm, but these involve economic considerations rather than health.

Racial considerations must always be taken into account, especially in case there is a large proportion of negro population. We southern health officers despair of having our northern friends understand how fundamentally important this really is. We frankly admit that a considerable part of the excess of the negro death rate is to be explained by average inferior living conditions, but we further believe that, so far as the negro in our cities is concerned, the death rate, as a whole, as well as the death rate from many important causes, will remain higher than the rate among the white race, even under equal sanitary conditions.

The negro has been taken out of savagery and thrust into an alien civilization. In rural life the contrast is not so great, but in our cities, where the artificial conditions of life are frequently so trying on the white race, we believe that, even under equal sanitary conditions, the negro is distinctly handicapped. In its slow advance in civilization the white race has more or less effectively eliminated the unfit at every step. With the negro this process of elimination is still going on, actively and intensely.

Other communities have racial problems quite different. Our large seaports have a steady stream of immigrants, a large foreign element to deal with. This class cannot be compared with the negro element in the South, because, in a general way, the immigrant is of a hardy type and must be physically fit in order to get in, besides being at a very favorable age period. Nevertheless, a large foreign element presents its own peculiar problems.

A mixed population as regards language gives rise to special problems. By way of illustration, we have our problem of health education greatly complicated.

Public lectures can be understood by only one special group. Bulletins have to be translated into several tongues. But frequently this is not enough. Some bulletins at least will lose much of their usefulness if the same ideas are presented in just the same way, except as to language, to native Americans, to Russian Jews, to Italians, to Germans and to various people of unpronounceable nationalities. The very nature of the text must be changed. The ideas, as well as the words, must be made comprehensible and appealing.

Age distribution of the population is a differential point of great importance, more perhaps in a statistical way that in an administrative. It is absurd and misleading to compare crude death rates of communities without taking this into account. Many of our most important preventable diseases claim their victims largely at certain age periods. It is utterly misleading to compare the death rate from such diseases in a city which has grown by normal excess of births over deaths with that of a city which has grown rapidly by influx of young adults. In the latter case we have not only an especially favorable age distribution of the population, but, perhaps even more important, a large proportion of robust citizens, individuals with vigor and energy enough to pull up stakes and start life anew in another field.

The points which I have endeavored to bring out are, to repeat, only suggestive. The list of diversities which I have given is not itself complete, and not one of these diversities has been fully dealt with, to say nothing of the almost endless combinations of two or more of them.

I have tried to bring out the fact that these differences in fundamental conditions are far more important than is generaly realized and that they should always be taken into account in formulating the health work which is done in any community. Held down in the amount of money which we may expend to an absurdly small sum, and held down also in our powers, we can do only a small fraction of those things which we know how to do, which we would like to do, and which it is harder not to do than it is to do.

We must realize that in addition to being well acquainted with the fundamental teachings of sanitary science and public health administration, we must make a special study of the peculiar conditions and needs of our own communities, in order that, as we succeed in getting a little more money, a little more power, we may apply that money and that power where they will accomplish most. If we fail to do this we do not only lessen our usefulness in our own communities, but, by our failure to do the best that we can do, we are also derelict in our duty of giving the fullest demonstration of the possibilities of intelligent public health work.

Every indication points to the fact that public health work, and especially municipal public health work, is to undergo a marvelous expansion in the next few years. Already we are beginning to get the people to see that a health department is not doing its full duty if it is merely reducing, no matter how greatly, the morbidity and mortality of certain diseases. Our new ideal is that every human unit shall be brought to the highest state of physical and mental efficiency. Within a very few years we will look back on the best of our public health work of today as almost ludicrously inadequate.

I suppose many of you have heard that within the past few months one of our greatest life insurance companies has appropriated the sum of one hundred thousand dollars to be used in fighting tuberculosis in some community of about five thousand inhabitants, or twenty dollars per capita to fight this one disease in this community, which I believe is not yet selected.

Only think of how this compares with the twenty or thirty or fifty cents which most of us get for all health purposes in our communities. It is purposed to make a demonstration with this fund. Nowhere yet in this country have we done more than merely scratch the surface in our efforts to control tuberculosis. It is proposed now to determine the result of doing everything we know how to do for the eliminating of tuberculosis in this single community. This, it seems to me, is one of the greatest things which has happened in the public health world in many a year. This demonstration will be of tremendous value, and it may be that within a few years it will be nothing unusual for municipal health departments to get at least one dollar per capita for all health purposes.

I wish, in closing, to emphasize again the undesirability of a standard health program for all cities, except, perhaps, in a few respects. Fundamental conditions are so diverse as to make this wrong in principle. Familiarity with local conditions is as essential to the health officer as is knowledge of sanitary science and practice. The working out of a health program adapted to his own community is the most fundamental, the most important and the most difficult administrative problem with which the municipal health officer has to deal.

The efficiency of the health department of any city is measured by the degree to which it is adapted to the needs of that particular community, and not by the degree to which it conforms to any arbitrary general standard.

ABSTRACT OF DISCUSSION

DR. GUY L. KIEFER, Detroit: With reference to the establishment of a standard for all communities, Dr. Levy is right when he says that this cannot be done, but I do think that it would be well for health departments in various communities to try to agree on what is really public health work. We hear of one city being allowed 30 cents per capita and another $1 per capita, and yet the one receiving the 30 cents may be spending it all in actual public health work whereas the other includes in its budget any number of unnecessary expenses for activities only remotely connected with the public health.

DR. FRANCIS E. FRONCZAK, Buffalo: A point well taken is as to how much money we shall spend on public health work. In some places they spend as little as 15 cents per capita and get better results than in other cities where they spend a dollar. It is a question whether such things as street cleaning, supervision of plumbing and drainage, and public baths should be included in health work or not; yet, many health departments cover such work. We have, on the other hand, communities that apparently do not spend any money for medical school inspection, which in my opinion is a public health work of superior importance. There is no doubt that communities are spending more money for public health work and are incidentally taking up functions that do not properly belong to the health department; for instance—street cleaning, privy vault cleaning, supervision of water, water works, and in some places even both natural and artificial gas is under the jurisdiction of the health department, but I for one do not see where such utilities legitimately come under public health work. Another point well taken is the question of climate. In one place they spend a lot of money for the drainage of swamps to relieve the section from the breeding of malaria-

bearing mosquitoes, as they are doing at the present time around New York City and in New Jersey, and this is most essential and excellent work, and work that really comes within the sphere of public health activities. On the other hand, in other parts of the country, there is no such necessity. Down South they are spending a lot of money to eradicate hookworm disease. Up North we do not have this worm, yet down South this is a very important public health activity. In regard to the question of milk, because New York has the Atlantic on one side, she is obliged to reach out for her milk supply from a distance, tapping several states. In inland cities, on the other hand, where there is a supplying district on all sides, there is no such necessity, nor such expenditure. In case of New York City it is a very important public health work, and the money spent for the purpose is well spent. I certainly agree with Dr. Rucker that a certain amount of money should be spent in the education of the community on matters relating to public health. Most cities do not spend as much money for this purpose as they should. Money properly spent in health department bulletins is certainly money well spent in municipal public health education. There are many instances where it would appear to be a waste of good white paper to print them.

Dr. I. M. Rubinow, New York: Dr. Levy pointed out the impropriety of comparing death rates without further analyses of the population, as for instance, the death rate of infants, and he indicated the necessity of taking into consideration the makeup of the population not only by age groups, but also by racial groups. There is, however, a substantial danger there, and especially a danger for southern cities, because it might offer a very convenient apology for bad results of health work. There is a tendency not only among southern statisticians, but unfortunately among northern statisticians, to explain too much by the negro death rate. Not being a northerner or a southerner, but having lived in both parts of the country, I want to point out that if you do get a high negro mortality rate, there are probably some very substantial material reasons for it, which may or may not be available to the public health work, but should not be taken as a sufficient excuse because we are dealing with the negro population. I doubt whether any substantial biologic or medical reason exists to think that a mortality rate of various races, at least after some time of the climatization, is substantially different, if their living and their mechanical, medical and physical conditions are substantially equal. Too much has been said about the biologically high mortality rate of negroes.

For instance, to draw on my own experience, I visited Atlanta. I saw the white children in schools which were perfect buildings in every respect. I also saw a negro school housing 800 children, a frame building, with individual class rooms, heated by coal, with sanitary conditions so poor that a stench was permeating the entire school, and with very little facilities for play for the children. Now, if you are going to get in Atlanta a higher child mortality rate for negroes than for white men, I think it would be very poor vital statistics to blame it on the color or the race of the children. It is a very substantial danger statistically as well as from the point of view of public health.

A negro, besides being a different racial element, is also a different industrial element. His industrial hazards to health are different. He is a different economic element. His wages are lower, and his food is therefore poorer. His housing conditions are very much worse.

Ten years ago I happened to come across some very interesting statistics dealing with the Russian peasant. I succeeded in proving statistically that the mortality rate of the Russian peasant, which is very high, higher than that of the negro, varied in inverse proportion to the amount of land the peasant had; the more land they had, the less the mortality rate was. The average rate was about twenty-six, and it varied from seventeen to thirty-four, according to the prosperity of the community. If a similar investigation was ever undertaken, I think it would be established that the mortality rate of the negro would not be higher and could be reduced to the same level as that of the white race.

Dr. Charles J. Hastings, Toronto, Canada: The most important phase of public health work is education. Dr. Levy spoke of the amount of money that was expended by insurance companies in this connection. I think we agree that that is the most valuable lesson that the public is receiving, so far as administrators of public health are concerned, because the insurance companies are in it for the money that is in it. They know that money used in public health work is not an expenditure, but an investment. They know they are going to get big returns out of what they spend in that way or otherwise they would not spend it. If we can have the public properly educated along that line, and the members of our various boards of health, and those who are responsible for supplying the sinews of war in this particular work, then a great deal, probably nine tenths of the work, will have been accomplished. In regard to the great objection to uniform standards: If we strike a happy medium between discarding that altogether and accepting a uniform standard, we will probably be a little safer. I think, undoubtedly, that to have a uniform standard up to a certain point is extremely important. I heard at a discussion in a medical meeting not long ago some rural public health officers refer to cases of measles in which they were satisfied that the contagion was conveyed through a letter from across the Atlantic. Now, when there is that condition of ignorance existing, I think it is extremely important that there should be a uniformity in regard to what the real sources and modes of infection are.

Most departments of health are doing a tremendous lot of work on what are only very indirectly public health problems. I do not think that any intelligent health officer today thinks that garbage disposal, or sewage disposal, or street cleaning, or even plumbing inspection, etc., are directly public health problems, and yet municipalities are having that charged up as a per capita allowance for public health administration. I do not think that one of us could trace any single death, we certainly could not trace any communicable disease, to that in any of our municipalities. It is a duty of the department of health to see that that work is properly administered, but it should not be charged up to the department of health. There is other work that a public health department should undertake, and that is to realize the fact that in putting up a campaign against communicable diseases, or all forms of diseases, that it must be directed along two distinct lines, first, to prevent the disease germs from entering the body; and second, to build up and maintain the resisting powers of the body against these germs, should an invasion take place. In endeavoring to do the latter, we find at the very foundation of public health administration the social problems in the home. We have got to get into the home. We have got to ascertain the revenue of the home. In many cases when we trace up diseases to the home, we ascertain that there is a social problem there, that the revenue of that home has not been sufficient to do more than simply keep soul and body together. It should be the duty of the department of health to act as social agents, and refer these cases to the proper social organizations, and see that the social problem is solved, because until the social condition is remedied they have not got at the real etiology of disease.

In regard to education, my experience in Toronto has been that the first ones we are required to educate are our boards of health and members of our council. It is extremely important that we have every member on our board of health an enthusiast in public health administration. We want to get him to realize that he constitutes one of the custodians of public health. I have always made it a point to advise the chairman of the board of health that whenever there was an obstructionist in the council, to have him appointed on the board of health, and inside of three months that man would advocate public health administration. When we get the public properly educated, and get public sentiment behind us, we can do anything.

Dr. O. P. Geier, Cincinnati: I would like to ask Dr. Levy to comment on the matter of industrial hygiene in the modern department of health. Recently there was formed an organization of industrial physicians. It seemed apparent that there were possibly hundreds of thousands of men today under very definite supervision of the industrial physician. Now they must be making a very definite contribution to public health work, and it seems to me it is possibly the new note in

public health work where the first opportunity comes of doing intensified personal hygiene with the individual.

DR. ERNEST C. LEVY, Richmond, Va.: The point brought out by Dr. Fronczak and Dr. Hastings as to what constitutes proper activities for municipal health departments is just what I tried to bring out. As I stated, there is no civic activity without some health aspect. It is for us to determine what things the health department itself should do. Other matters having such intimate relation to public health as one of the things referred to by Dr. Fronczak, namely, the attention to privy vaults, need not be actually done by the health department, but the health department should by all means have such control over it as to see that it is efficiently done.

I cannot agree with Dr. Rubinow in some of the things he said regarding the negro race. I can only repeat what I have said, that it is only those of us who work in the South and are familiar with this problem who understand each other. As I tried to bring out, we do not say for one minute that inherent racial peculiarities are the only thing responsible for the high negro death rate, but we do say that these remain after you have done everything else that you can do; and I further qualify this by saying that this applies to our cities. I do not believe that in the country the difference between the death rate of the colored race and the white race is so marked. But it is in our cities, in spite of anything which we may do. Under equal sanitary conditions the negro death rate in cities is much higher than the white race. It seems to me there is, perhaps, one little discordant note in the discussion which was due to my not making myself understood. I do not think that we can standardize a complete working program of municipal health departments, but I do think that we can standardize each of the activities. We can have standardization of the various units of municipal public health activity, but the determination of which of these units we are going into depends on the factors I have discussed.

Dr. Hastings' account of the doctor who thought that a case of measles was brought by a letter from abroad is of course not an illustration of any need of standardizing our public health activities, but of the need for better education in sanitary science. I am very glad that Dr. Geier touched on the question of industrial hygiene. It strikes a new note in public health work. The future in this direction is tremendous. I do not know of anything more important. Unfortunately, few of us know much about it.

There is in my mind, however, even a newer note than that, and also a bigger one. Up to a few years ago we were content to have for our highest ambition the prevention of certain diseases. If we did not have people dying of typhoid fever or malaria, or one or another communicable disease, we thought we had done just about all we could. Nowadays our ambition is far higher. We are not doing enough if we simply keep the people from dying of disease which we class as preventable. The newer ambition of public health work is a community of strong, robust, aggressively healthy people, every unit in it developed to its highest activity of mind and body.

Endemic Diseases and Mental Retardation.—Not only does the continued presence of endemic diseases entail great economic losses to communities where they prevail by reducing the physical efficiency of a great part of the population, but they are also accompanied by a similar reduction in mental efficiency. These harmful influences continue to exist because of the general lack of information so common in rural communities concerning their cause and prevention. In a number of instances it is a difficult matter to secure the cooperation of the adult population, which is set and fixed in its habits, in measures intended to improve the community health. Health supervision of school children not only gives valuable information concerning the prevalence of these conditions, but it also exercises an educational effect on the rising generation, through whom the sanitary redemption of these communities is largely to be brought about.—T. Clark, *Public Health Reports*, Aug. 25, 1916.

A FURTHER REPORT ON THROMBOPLASTIN SOLUTION AS A HEMOSTATIC *

ALFRED F. HESS, M.D.
NEW YORK

Somewhat over a year ago, in a preliminary report on "Tissue Extract as a Hemostatic,"[1] it was stated that a very efficient hemostatic could be prepared from brain tissue, and that this preparation, which was termed "thromboplastin," had been found serviceable for local use in hemorrhage, especially in bleeding associated with true hemophilia. This substance is a solution and a fine suspension of ox brain in normal salt solution, with 0.3 per cent. of tricresol added in order to preserve it. Some months later a paper was published by Cronin[2] stating that he had made use of "thromboplastin" in a routine way in over 2,000 tonsil and adenoid operations which were performed in the clinics of the New York department of health, and that he found it of decided value in decreasing bleeding and the incidence of undue hemorrhage. For about a year the research laboratory has distributed thromboplastin solution to physicians and has collected reports on the results obtained. During this period I have also had many occasions to make further trials of its clinical value, and have also carried out numerous laboratory tests to determine more fully its various properties. It is the sum of these twofold experiences which forms the basis of this second report.

Thromboplastin solution has been supplied to several of the maternity hospitals of the city, where it has been employed locally in cases of melena neonatorum, in bleeding from the cord, skin, mouth, vagina, etc. It has also been used by physicians in these institutions as a dressing where there was undue hemorrhage following circumcision. The following two cases illustrate its application in melena:

CASE 1.—April 18, 1916, baby 1 week old, seen at the Bellevue School for Midwives, on the service of Dr. Austin Flint, showed numerous cutaneous hemorrhages, as well as some in the mouth, at the junction of the hard and soft palate. The main site of bleeding was the cord. There had been some bleeding from the bowel. Jaundice was moderate. Thromboplastin solution was applied to the cord, and the bleeding was checked and did not recur.

A case which is of particular interest on account of the persistence of the bleeding and the fact that numerous other hemostatics had been previously applied without result was the following:

CASE 2.—Jan. 15, 1916, a 5-day-old baby was seen on Dr. Edwin Cragin's service at the Sloane Maternity Hospital. The frenum of the tongue had been incised two days previously, and since this time hemorrhage had persisted. When seen, the infant presented some subcutaneous ecchymoses and a small hematoma of the scalp, and was evidently suffering from loss of blood. Various measures had been tried to check the bleeding. Human serum and whole blood had been injected subcutaneously. Locally silver nitrate had been used, tannic acid applied assiduously for a period of two hours, and clamping had been attempted. The bleeding persisted for two days in spite of all these efforts. Thromboplastin solution was applied locally with partial success. Following this a few cubic centimeters of the preparation (which had

* From the Research Laboratory, Department of Health, New York City.

1. Hess, A. F.: Tissue Extract as a Hemostatic, JOURNAL A. M. A., April 24, 1915, p. 1396.
2. Cronin, J. J.: Thromboplastin (Tissue Extract) as a Hemostatic, THE JOURNAL A. M. A., Feb. 22, 1916, p. 557.

been brought to the boiling point) were injected into the site of the hemorrhage at the root of the tongue. The bleeding stopped at once and did not recur.

This case raises the question as to the most effective method of applying thromboplastin solution. In this connection it may be stated that, as in the instance just cited, where topical applications do not check the bleeding, some of the solution should be boiled and if possible injected into the site of the bleeding. This method of application is especially suitable in bleeding from the gum, which frequently offers great difficulties following the extraction of a tooth. The following is a case in point:

TABLE 1.—CLOTTING EFFICIENCY OF THROMBOPLASTIN SOLUTION

	Thromboplastin Solution Unboiled		Thromboplastin Solution Boiled (One Minute)	
	Strength of Thromboplastin Solution Added,* per Cent.	Coagulation Time of Plasma, Minutes	Strength of Thromboplastin Solution Added, per Cent.	Coagulation Time of Plasma, Minutes
Test A, with plasma having coagulation time of ten minutes.....	100	1	100	2.5
	50	1	50	2.5
	10	1	25	2.5
	1.0	2	1.0	4
	0.5	4	0.5	6
Test B, with centrifugalized plasma having coagulation time of twenty-two minutes.....	10	3	10	6
	1	5	1	8
Test C, with human plasma having coagulation time of thirteen minutes.....	100	1	100	1.5

* In all tests 1 drop of thromboplastin solution, 5 drops of oxalated plasma, and an optimal amount of calcium chlorid solution were used.

Case 3.—Oct. 5, 1915, a young man with splenomyelogenous leukemia was seen at Beth Israel Hospital. A tooth had been extracted five days previously, and since then there had been almost continuous bleeding. Serum had been given subcutaneously; serum, human blood, epinephrin, coagulen and emetin had been applied locally without avail. Thromboplastin solution was then applied locally, but as it did not check the steady oozing, some was heated to the boiling point and injected into the gum. The bleeding promptly ceased.

In discussing the method of applying thromboplastin solution, emphasis should be laid on the necessity of having it come into direct contact with the bleeding point; if soft clots have formed, they should be removed from the wound. Furthermore, although a cursory application in many instances will suffice to hasten coagulation, where such does not prove to be the case, the hemostatic should be held in close contact with the bleeding surface for some minutes. From time to time cases have been encountered in which attention to this detail has checked hemorrhage which had seemed uncontrollable. For example:

Case 4.—Nov. 1, 1915. Bleeding in young adult following tonsillectomy. Tonsils had been excised twenty-four hours previously and the patient had bled ever since. He looked pale; the red blood count was two and one half million. Emetin had been applied locally, as well as pressure. Salt solution had been given intravenously. Thromboplastin solution was applied locally and was thought to be of no avail; applications were being made every minute or two at the time the patient was seen. When, however, the swab, saturated with the solution, was left in contact with the bleeding surface for from ten to fifteen minutes (so that a firm clot should have time to form) the bleeding stopped permanently.

It seems unnecessary to cite further instances of the efficacy of this hemostatic when applied locally. In a very few cases it has failed, although the reason has not been clear.[3] As was emphasized in the previous report, it must be regarded almost as a specific in the bleeding of true hemophilia, a disease characterized by a prolonged coagulation time. This is as we should expect when we consider the remarkable coagulative power of this preparation when added directly to blood or to plasma. Further clinical experiences have served only to strengthen our reliance on thromboplastin solution in this hemorrhagic condition, so that we believe that those who suffer from this disease would do well to have a preparation of tissue juice at hand in case of emergency. It is the general experience that these "bleeders" frequently die, not from a sudden loss of blood, but from a persistent oozing from the tongue or mouth which gradually drains their vitality. Hemorrhages of this type yield promptly to thromboplastin.

There have been many inquiries as to the advisability of using this preparation in gastric or intestinal hemorrhage. It is very difficult to judge of the success of any therapy in cases of this kind, and it will require a trial in many more such cases before a definite opinion can be formulated. It has hardly seemed that it would be efficacious in bleeding from the ileum or from the large intestine, as much of it would be digested by the proteolytic ferments and destroyed by the time it reached this part of the intestinal tract. However, we may find that if large amounts are taken by mouth or if it is given in a form which will protect it from disintegration, or, perhaps, if it is poured directly into the intestine through a duodenal tube, it will prove of value in bleeding from the lower bowel. As far as we are

TABLE 2.—EFFECT OF FILTRATION, CENTRIFUGATION, ETC., ON POTENCY OF THROMBOPLASTIN SOLUTION

Preparation of Thromboplastin Solution (2 per Cent. Dilution)	Drops of Thromboplastin	Coagulation Time (5 Drops of Old Oxalated Plasma) Minutes
Control plasma (no thromboplastin)	..	24
Untreated solution	1	10
	2	8
	3	8
	4	6
Boiled (1 minute)	1	8
	2	6
	3	6
	4	6
Filtered	1	10
	2	8
	3	8
	4	6
Centrifugalized (supernatant fluid)	1	10
	2	8
	3	8
	4	6
Filtered and boiled	1	14
	2	12
	3	10
	4	8
Centrifugalized and boiled	1	14
	2	12
	3	10
	4	8

In a similar test, plasma which coagulated in thirteen minutes clotted in one minute on addition of 1 drop of undiluted thromboplastin solution; in one and one half minutes when the solution had been boiled; in three minutes when the supernatant centrifugalized fluid was used, and in two minutes when this fluid had been previously brought to the boiling point.

3. These intractable hemorrhages have almost invariably followed circumcision, and all local measures have failed, so that transfusion had to be resorted to.

aware, it is nontoxic when given by mouth; 60 c.c. have been given in the course of twenty-four hours and have produced no untoward effects, and we should not hesitate to give double this quantity. In gastric or duodenal hemorrhage it has seemed of value, and should certainly be given an extended trial. It may also be used locally in rectal bleeding by means of a proctoscope. The following four cases, Case 5, gastric hemorrhage from ulcer, Case 6, gastric hemorrhage in hemophilia, Case 7, duodenal hemorrhage

TABLE 3.—COMPARATIVE TESTS OF ACTIVITY OF THROMBOPLASTIN SOLUTION PREPARED FROM BRAIN CORTEX AND FROM MEDULLA

One per Cent. Thromboplastin Solution (1 drop)	Coagulation Time Old Sheep Plasma, Minutes	Coagulation Time Old Horse Plasma, Minutes
Control plasma (no thromboplastin)	22	14
Medulla	3	2
Cortex	3	3
Medulla (solution boiled)	6	6
Cortex (solution boiled)	4	5

in an infant, and Case 8, rectal hemorrhage in a hemophiliac, illustrate these several conditions:

CASE 5.—April 26, 1916, man, admitted to Beth Israel Hospital, had severe gastric hemorrhage. Thirty c.c. of thromboplastin solution were given in 6 ounces of water, and three 20 c.c. doses diluted in 4 ounces of water during the following day. There was no further hemorrhage.

CASE 6.—Jan. 3, 1916, hemophiliac boy who had been under observation for several years vomited a considerable quantity of blood. He was sent to the hospital, where he vomited blood twice. He was then given 10 c.c. of thromboplastin solution diluted in 2 ounces of water; this dose was repeated in three hours. There was no further hematemesis.

CASE 7.—April 17, 1916, baby born the previous day at Bellevue Hospital, in Dr. Austin Flint's service, that evening vomited blood at 5:30, and twice again before 10 o'clock. Thromboplastin solution was given by mouth, 2 c.c. in a tablespoonful of water. There was no vomiting for twenty-four hours. Hematemesis recurred, with bloody stools, and death followed.

CASE 8.—Dec. 28, 1916. Typical hemophiliac, a brother of the patient in Case 6. Blood had been noted in the stool since December 6, and had increased until five days previously, when pure blood was passed. He was sent to the hospital, where proctoscopic examination showed an ulcer in the rectum. Thromboplastin solution was applied on strips of gauze, and bleeding ceased. This treatment was repeated on the following day. There was no further bleeding while the patient was in the hospital.

It may be of advantage to note a few other conditions in which our records show that thromboplastin solution has been used successfully. In this connection may be mentioned the nasal hemorrhage associated with toxic conditions, more especially diphtheria, for which it has been employed extensively at the Willard Parker Hospital for Contagious Diseases; and likewise for nasal hemorrhage complicating the primary blood diseases, for example, in acute leukemia; furthermore, at operation for hepatic bleeding, in bleeding from the urinary bladder, in operations involving the spinal cord, in prostatic operations, and in bronchoscopy in connection with the removal of diphtheritic membrane or old foreign bodies with bleeding granulation tissue.

As my preliminary paper contained nothing whatsoever regarding the action of thromboplastin solution in vitro, it may be well to report some tests showing its action on plasma, and to illustrate how this activity is affected by various manipulations, boiling, dilution, centrifugation, etc. Table 1 demonstrates the marked clotting power of 1 drop of thromboplastin solution on 5 drops of plasma; it also shows that a 1 per cent. dilution of this preparation acts almost as well as the undiluted fluid. This has frequently been observed in similar tests, where it required a dilution even greater than 1 per cent. to diminish the coagulative efficiency of the thromboplastin. This phenemenon is probably to be explained by the fact that in the undiluted state it possesses a great excess of coagulative power. It may be added that it has been found to possess some potency even when diluted 5,000 times, and that 1 drop of a 1:500 solution has lessened the coagulation time of plasma by one half. Table 1 also illustrates that a cursory boiling serves to weaken the preparation only slightly, and does not radically impair its power.[4] It may be pasteurized without affecting its potency (Table 4).

When thromboplastin solution is filtered, it becomes a clear, transparent fluid which possesses considerable coagulative power. Table 2 shows the efficiency of the filtrate of a 2 per cent. dilution; it likewise shows that this weak filtrate even after being boiled is able to cut in half the coagulation time of plasma. The fact, which is also brought out in the table, that coagulative potency resides in the supernatant fluid obtained after centrifugation, shows that we are dealing with a substance which is active in a clear solution as well as in turbid suspension.

Table 3 is included to demonstrate that the coagulative potency of the gray and of the white matter of the brain is practically the same. In view of this test and of similar results in other tests, we have made use of the brain in its entirety in preparing thromboplastin solution.

Thromboplastin may be desiccated at a low temperature and then used as a hemostatic. We have prepared a powder of this kind, diluted with a large

TABLE 4.—EFFECT OF HEATING THROMBOPLASTIN SOLUTION FOR ONE HOUR AT 55 C.

Preparation of Thromboplastin Solution	Drops of Thromboplastin	Coagulation Time (5 Drops of Old Oxalated Plasma), Minutes
Control plasma (no thromboplastin)	..	20
Thromboplastin solution, unheated	1	2
	2	1
	3	1
Thromboplastin solution, heated	1	2
	2	1
	3	1
Thromboplastin solution, heated and centrifugalized	1	2
	2	2
	3	1

quantity of lactose, and preserved by means of boric acid. This powder was able to hasten coagulation in vivo as well as in vitro, and was found of clinical value under certain conditions. Neither boric acid nor the tricresol made use of in the fluid preparation lessened the potency of thromboplastin solution.

We have also made considerable use of weak dilutions of thromboplastin solution for intravenous, subcutaneous and intramuscular inoculation, where the bleeding was inaccessible to local treatment. Although it is too early to report on this aspect of the subject, it

4. Occasionally, as may be seen in Table 2, a brief boiling enhances rather than weakens the efficiency of the preparation.

may be stated that when proper dilutions are employed, this mode of therapy is without danger.

There is quite another aspect of this subject which is of interest. In the course of the use of thromboplastin solution as a hemostatic, it was noted that it stimulated the healing of wounds and of raw surfaces. This was first called to our attention by a patient suffering from hereditary telangiectasis of the nasal mucous membranes, who, in addition to frequent attacks of epistaxis, suffered from superficial ulcers in the anterior nares. He noted that the thromboplastin solution not only checked the hemorrhages, but healed these ulcers, which had been of long standing. Prompted by this experience, thromboplastin solution has been employed for the past six months or more as a dressing of wounds and of ulcers of long duration. These observations have been carried out for the most part at the Central and Neurological Hospital of the Department of Public Charities, where inmates remain for months or years and therefore can be observed for long periods. This work was kindly undertaken by Dr. Harold Neuhof, who makes the following report:

Between eighteen and twenty cases have been treated with thromboplastin solution for a sufficiently long period to gage the results. Twelve were chronic ulcers of the leg, eleven varicose and one syphilitic. All showed that the fluid thromboplastin is an active stimulant, aiding healing. Several ulcers of long standing were healed completely; one recurred subsequently, to heal promptly with further treatment. One case of broken down laparotomy wound responded well to the fluid, also a sluggish ulcer of the neck following operation for carbuncle in a diabetic patient. A case of ulcer in the axilla following burns did very well, as did an ulceration about the umbilicus following infection. In none of the cases was thromboplastin solution used until it was evident that we were dealing with sluggish, chronic lesions that did not respond to the usual treatment. Leg ulcers of long standing (Central Neurological Service) cleaned up very nicely, but these very extensive lesions, of many years' standing, did not progress to healing. The lesions were put in such condition, however, that further (operative) measures could be considered advisable, whereas heretofore they were out of the question.[5]

In this report a fluid thromboplastin is mentioned in contradistinction to an ointment which was also used for healing purposes. To this end one part of brain substance was ground up with three parts of lanolin, which had been heated to a fluid state; 3 per cent. boric acid was added as a preservative. It was found, however, by Dr. Neuhof as well as by others that the ointment applied to raw surfaces did not bring about as prompt response as did the fluid preparation. When used as a local application in eczema, especially in some cases in infants, the ointment seemed to show a marked curative effect. Finally, it may be added that we have received a favorable report on the use of the fluid thromboplastin as a drip in conjunction with the application of skin grafts to wound surfaces.

CONCLUSIONS

Tissue juice made from brain (thromboplastin solution) has proved itself of practical value in controlling hemorrhage wherever it can reach the site of bleeding. In cases of true hemophilia it may be regarded almost as a specific hemostatic. It is to be recommended for local use in the bleeding of the newborn, in nasal hemorrhage, and in the parenchymatous bleeding associated with various operations, etc. Where local applications fail, it should be injected into the site of hemorrhage, as in bleeding from the gums following tooth extraction. This method can readily be resorted to, as thromboplastin solution loses but little of its potency as the result of dilution and cursory boiling.

Further clinical experience is necessary before its value can be determined as a hemostatic in connection with hemorrhage of the gastro-intestinal tract. However, it is innocuous when given by mouth in considerable dosage, and would seem to be indicated in bleeding from the stomach and from the upper intestine.

In addition to its hemostatic action, this tissue extract has been found to possess healing properties, actively stimulating granulation tissue and hastening epithelization. It is therefore applicable as a dressing for torpid ulcers and for sluggish wounds.

16 West Eighty-Sixth Street.

5. In treating ulcers the surrounding skin should be protected from irritation by petrolatum or some bland ointment. Its beneficial effect is possibly due to its ability to remove infected or unclean sloughs from the surface of the ulcers, possibly in part to the direct effect on the tissues with which it comes into contact.

ITCHING AS A SYMPTOM *

PHILIP KILROY, M.D.
SPRINGFIELD, MASS.

For every peripheral impression there is a corresponding psychologic phenomenon which we call a sensation. One of these is itching. The nature of the sensation depends on the cerebral interpretation; were the acoustic fibers to end in the optic centers, and the optic fibers in the acoustic centers, we would hear the lightning and see the thunder. A sensation may be perceived without any stimulus. This is a hallucination, and just as seeing things or hearing things, so may feeling things — even feeling itchy — be hallucinatory. This is pathologic, but there is a physiologic analogue. *Nihil est in intellectu quod non erat prius in sensu* is axiomatic, and because thought and sensation are identical in seat, and similar in nature, it follows that itching, like any other sensation, and states of mind are closely related.

A potent factor in itching, wholly apart from the cutaneous changes it occasions, is the habit of scratching; to scratch one's ear for a mild itching, today, is to have to scratch it tomorrow for a severe itching. Itching may be a symptom of skin disease. Quite often the disease is a product of the itching: eczema frequently, prurigo generally, lichen simplex always are the cutaneous reactions of scratching.

Our comprehension of qualitative difference in sensation is obscure and hypothetic. From a neurologic point of view I refuse to admit the existence of the so-called sensory dissociation, and the whole diagnostic edifice built thereon. There is neither reliable anatomic basis nor convincing experimental proof for the notion that there are different fibers or terminals, or spinal tracts, for the perception, or transmission, of different sorts of general sensation, as touch, pressure, pain, heat or cold. They are all due to varying stimuli of a similar nerve, no more different from one another than are those troubles of sensation, called paresthesias, admittedly deviations of normal general sensibility.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

Variation in wave length gives variation in sound; and we need no further explanation for the variation in the perception of colors. Disease of the auditory nerve will cause loss of perception of one pitch of sound, the perception of another pitch being conserved, and we need no further explanation than this suggests for the phenomenon of colorblindness; and just as reasonably can we accept that variation in the sense of touch is a different stimulus of the same nerve. The senses of taste and smell present many peculiarities. No mechanical stimulation of the nose will give a sense of smell. No material, however, fragrant, applied to the nose gives an odor — the substance must be in vapor; but stagnant vapor in the nose, without breathing, gives no odor. The vapor must move, and must move from without inward. Inhalation of a fragrant vapor through the mouth and exhalation through the nose gives a scarcely perceptible odor, though markedly so to another, this being the chief explanation of the onion phenomenon.

A peculiarity of the sense of taste that I would like to emphasize, for its later application, is that very cold and very hot things lose most of their flavor.

Arguments in favor of sensory dissociation are found chiefly in considering syringomyelia, the supposed syringomyelic dissociation being loss of the sense of pain and of temperature, with conservation of the senses of pressure and touch. But all such observations are so relative, and the results so discordant as to be of little value. They can be explained as dulled, or disturbed sensation. No sensation is so unreliable as our sense of temperature, for this is not a thermometric but a calorimetric sense, not a measure of heat but of radiation. The piece of metal and the piece of wood, of the same temperature, do not seem of the same temperature, because the one is a better heat conductor than the other; warm water seems hot to the cold hand, and cold to the hot hand.

The different causes that bring about itching are in harmony with the theory that itching is only a variation of the sense of touch or pain. All conditions, local or general, that, in one degree or one individual give pain, give, in a different degree or in a different individual, itch. I scarcely need allude to the alternating, or coincident, pain and itching in dermatitis, in many forms of burn, in Duhring's disease, in phlebitis, in zoster. The itching of the latter, as well as of many deep seated inflammations, disproves the notion that itching has its seat in the epidermis. I have found frequently that itching antedates, or accompanies the pain of sciatica; itching of the lower abdomen is a common symptom of prostatic trouble; mild affections of the sacro-iliac joint often cause itching of the lumbar region; hemorrhoids cause itching more often than they do pain. The author who formerly taught that itching was due to a disproportion between the pressure of the tissue fluids and the counter-pressure of the epidermis, and that, hence, relief came when scratching drew blood (which is not so, for the itching often grows worse with the drawing of blood), has recently given, as an explanation of general pruritus, the irritating effect of circulating toxins on the endothelial branches of the vascular nerves. This is putting the seat of itching in the sympathetic, where Jacquet put it long ago, both without proof. It is, indeed, very improbable that the vascular nerves carry any sensory fibers. The indolence of arsenobenzol intravenously, which is so painful elsewhere, almost disproves it. The suggestion, made several years ago, in an address to this society, that itching was a sort of aphrodisiac remnant of a period when sex sensation was not specialized, and that scratching gives sensations of a voluptuous nature, has, perhaps, the negative merit of not being as bad as freudism.

All the toxic states that lead to rheumatism or neuritis are also causes of itching — obesity, Bright's disease, diabetes, jaundice and every infection. The pruritis of old age is senile only indirectly, senility being prone to toxemias; the pruritus of the menstrual period and the menopause, especially artificial menopause, is increased sensitiveness or toxic; the itching that follows the removal of pressure is a reaction akin to the sensation that follows one's foot being asleep; the itching of cold weather is a vindication of the ancient truth, doubted of moderns, that cold is an inflammatory agent.

And with our therapeutic measures, too, those that give relief add proof to the theory that itching is a variety of pain. Diet, rest, salicylates, eliminants, things whose worth has been proved in gouty states, are effective in relieving itching. Probably pyramidon and sodium bromid should be put at the head of general antipruritic agents. The successful local applications are those that benumb; the ethyl chlorid that causes local anesthesia will, in milder application, relieve itching; all cold benumbs, and hence the benefit of ethers, alcohols or menthols. Heat benumbs, too, and the antipruritic influence of very hot water is a matter of common knowledge. Heat and cold are applications for relief of pain also, and I have mentioned their benumbing influence on gustatory keenness.

Nor is there anything mysterious, anything rudimentary, anything atavistic in the act of scratching. We do it because it dulls the terminals. It is analogous to rubbing a painful joint, stroking the aching forehead or squeezing a bruised finger.

In these remarks I have wished merely to emphasize the essential simplicity of a symptom that gave evidence of becoming abstruse.

61 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. A. RAVOGLI, Cincinnati: This paper is not only interesting but very important to the dermatologist, who, aside from those cases in which the itching is severe and distressing, sees many cases in which it is an important symptom and the one from which the patient is most anxious to be relieved. I would not, however, call pruritus a sensation, but rather a perversion of sensation. The patient is compelled to scratch until he produces excoriations with the accompanying pain which in turn relieves the itching. The itching sensation is due to an acute effusion or infiltration on the papillary layer, and, as Hebra said, you might as well tell a man not to cough as not to scratch when the necessity arises. The itching sensation accompanies all the parasitic affections, and is one of the most stubborn symptoms. We may cure a case of scabies in a few days, but the patient returns, still complaining of itching, which is due to the irritation of the papillae of the sensitive nerves of the skin. In eczema and many other diseases we have this symptom of itching, and it is necessary to try to relieve it. I find that an alkaline bath, with bicarbonate of soda, often eases the sensation; also the application of a solution of phenol (carbolic acid). I have not had good effects with menthol or anesthesin, which both have increased the irritation.

DR. MICHAEL LEO RAVITCH, Louisville: Itching, as headaches is a symptom of disease: search for and relieve the cause and you will relieve the itching. There is so much latent pathology in pruritus, that we must take more time and patience to study it. Without going into the pathology and etiology of pruritus we are bound to treat it empirically.

THE PROBLEM OF DIPHTHERIA CARRIERS *

SOPHIE RABINOFF, M.D.
NEW YORK

Up to the present time, the problem of the diphtheria carrier remains unsolved; and the variety offered in the way of treatment, and the conflicting results reported, all bear evidence that no specific method has yet been discovered. One is impressed, furthermore, in reviewing the literature, by the fact that the interpretation of the results of treatment is subject to wide variations.

Our experience with diphtheria carriers, while not presenting new methods, may be of interest from the standpoint of their care and treatment when occurring among a large group housed under one roof. The problem became acute last winter during an outbreak of diphtheria at an institution which cares for about 400 children under 5 years of age. All the children had been subjected to the Schick test in a routine way previously, so that we had a record of susceptibles and nonsusceptibles. Several cases of diphtheria occurred among the children, as well as among the attendants. These patients were promptly isolated, and efforts were made to protect all children who showed a positive Schick reaction, by the administration of antitoxin. At the same time, nose and throat cultures were taken of every one in the institution, adult attendants and nurses as well as children. In view of the fact that the immunity conferred by the antitoxin is only temporary, lasting about three weeks, our efforts were directed to the prompt elimination of carriers, as we realized that at the end of this period of acquired immunity, the susceptibles would again be exposed to infection.

To begin with, the carriers were either isolated or placed in dormitories with children shown by the Schick test to be immune. Only those patients were considered carriers who had two successive positive cultures. Local treatment was rigorously carried out, and with almost every method there were some cases that became negative; but the problem resolved itself to the group of resistant cases which continued to show the bacilli over a long period of time. What made it the more difficult to judge the results was the fact that in some of these cases the cultures would show a diminishing number of bacteria and become negative, but, after cessation of treatment for a few days, would again be positive. We have therefore continued to follow up discharged patients, and have now observed them for periods of from two to six months.

In relating our experiences, I shall state briefly the results obtained with each method. At first simply the silver preparations were used in the form of silver nitrate in strengths of from 2 to 10 per cent., and argyrol in strengths of from 20 to 50 per cent. Weak solutions of formaldehyd and of tincture of iodin (1 per cent.) were used with about the same degree of success. With a view to replacing the diphtheria with less virulent organisms, emulsions of *Staphylococcus pyogenes-aureus*, *Bacillus bulgaricus*, and *Bacillus acidi-lactici* were used. In a number of instances, these gave some temporary results; but as soon as treatment was stopped, in the majority of cases, the diphtheria bacilli returned.

* From the Home for Hebrew Infants.

The use of iodized phenol, as reported and recommended by Ott and Roy,[1] did not give very satisfactory results in our hands. The U. S. pharmacopeial preparation was used and applied to the mucous membranes of the nose and throat on alternate days. These applications were followed by severe sloughing accompanied by profuse, foul-smelling discharge. Among a group of twenty-five cases treated by this method, five showed negative cultures after three treatments, and one after five treatments. In all the remaining cases, six applications were given, but the nature of the local reaction and the attendant discomfort to the patient was such that we did not feel justified in continuing further.

Our next step was to divide the carriers into two groups, one of which received no treatment, the other receiving the following: Fullers' earth[2] was blown into the nose three times daily with a powder blower, according to the method suggested by Rappaport and Hektoen.[3] In this group, which included twenty adults, the results obtained in the adults were very satisfactory. Fifteen out of twenty showed negative cultures within a period of from one to two weeks, the remaining cases lasting about ten days longer. In the twenty-five children of this group, only four, or about 15 per cent. of the cases, showed negative results within the same period, this being about the same percentage obtained with other methods. In the second group, as I have stated, no local treatment was given. During the same period of time, practically the same percentage, four out of twenty-three, became negative.

It was finally decided to remove the tonsils and adenoids in all cases in which the organisms persisted. Arrangements were made for taking small groups at a time, and pending operation cultures continued to be taken up. The operations were performed by Dr. Milton J. Ballin. Up to the present time, we can report only a small group, ten in all, but the results are so promising that we feel justified in proceeding with this mode of treatment. The patients run the usual course following tonsillectomy. After the membrane which forms at the tonsillar incisure has disappeared, the cultures invariably become negative, our results being similar to those recently reported by Ruh, Miller and Perkins.[4]

In the group of cases studied, there were five children in whom examination of the nose revealed a shoebutton. After the removal of the shoebutton, the cultures became negative.

CONCLUSIONS

1. In the group of eighty diphtheria carriers which were studied, it was found that a certain number became negative, irrespective of the treatment employed. No better results were obtained with iodized phenol or with fullers' earth, than with the silver preparations or other antiseptics. Indeed, those

1. Ott, W. O., and Roy, K. A.: The Treatment of Diphtheria Carriers with Iodized Phenol, THE JOURNAL A. M. A., March 11, 1916, p. 800.

2. Fantus, Bernard: Fullers' Earth: Its Adsorptive Power, and Its Antidotal Value for Alkaloids, THE JOURNAL A. M. A., May 29, 1915, p. 1838. Hess, Alfred F.: Fullers' Earth in the Intestinal Disorders of Infants, ibid., Jan. 8, 1916, p. 106.

3. Hektoen, L., and Rappaport, B.: The Use of Kaolin to Remove Bacteria from the Throat and Nose, THE JOURNAL A. M. A., June 12, 1915, p. 1985. Rappaport, B.: The Use of Kaolin to Remove Diphtheria Bacilli from the Nose and Throat: Further Observations, ibid., March 25, 1916, p. 943.

4. Ruh, H. O.; Miller, M. J., and Perkins, R. G.: The Treatment of Diphtheria Carriers by Tonsillectomy, THE JOURNAL A. M. A., March 25, 1916, p. 941.

cases which were not treated in any way did equally as well. An exception must be made only as regards the results obtained with fullers' earth in adults, which were fairly satisfactory.

2. The real problem of the carrier lies in the ultimate group in which the bacteria persist in spite of all local treatment.

3. The presence of a foreign body in the nose may provide a favorable environment for the growth of the diphtheria bacilli.

4. Removal of tonsils and adenoids seems to offer a safe and rapid method of eliminating diphtheria bacilli from the nose and throat of carriers, and should finally be resorted to where other methods have failed.

DISTRICT HEALTH ORGANIZATION*

C. ST. CLAIR DRAKE, M.D.
Secretary of the Illinois State Board of Health
SPRINGFIELD, ILL.

Every progressive state in the Union is now engaged in an effort to increase the efficiency of its public health administration. The strides of knowledge in preventive medicine are so great and so rapid that no state can be said to keep pace with the times unless it is actively forging forward looking for newer and better things.

In the rapid changes which have come within the past few years this fact has been conclusively demonstrated to us, that however powerful and efficient the central or state health organization may be, it cannot be effective unless it has some means of reaching out into every section of the state and, through its own representatives, coming in contact with all of the people and with their varying sanitary and health problems. The central organization, operating only at a single point in a large state, is not enough. Incidentally, local health departments, even when well conducted and adequately equipped, which is a very rare condition for them, are not enough. For the maximum of efficiency there must be the good central or state organization, the good municipal or local department and, further, a strong and effective link between the two. The connecting link is as important as the other agencies.

In Illinois, as in many other states, the local health authorities have gone pretty much their own way, the state board of health being regarded as a general educational organization, affording a certain amount of assistance to the health officers and the physicians of the state, but for the most part, as the agency to which appeal should be made in times of epidemics and calamity. Aside from its very general administrative functions, the state board of health remained largely the means of meeting emergencies, rather than being actively engaged in constructive public health work. The relationship between the board and the various local health officials has been cordial, but not intimate, the personal representatives of the board rarely visiting the various communities except in time of unusual public health upheaval.

As is doubtless well known to most of you, the last general assembly marked the closing and the beginning of eras in the sanitary history of Illinois. For many years Illinois has made little progress in public health legislation, lagging behind the other progressive states, which, on account of constant legislative enactment, had been able gradually to develop their public health forces. After twenty-five years of relative inactivity, the forty-ninth Illinois general assembly suddenly passed a group of upward of thirty laws bearing on social, civic and sanitary development, the largest number of salutary measures passed in any state during the year.

The passage of these progressive laws imposed enormous obligations and immense burdens on the state board of health and other state departments. Numerous measures, involving large administrative preparation, such as an entirely new method of birth and death registration, demanded immediate and sane action. Increased appropriations for the reorganization of the entire state health service involved the necessity of creating an entirely original plan, rather than merely developing methods already in operation.

The situation in Illinois was, in a way, quite unique. An old state, with a once efficient health department now fallen to decay, finds itself authorized to lay its foundations and build from the ground up, with very little of the old machinery worthy of use, very little of it that has to be retained and very little of it to point the direction which development would take. It seemed a splendid opportunity to build the ideal health organization. Certain very real difficulties stood in the way of this.

While quite free rein was given in the reorganization of the health organization plan, the appropriations had been increased only to a very moderate extent, making it impossible to complete any form of structure. It was consequently necessary to make the plan, to construct the skeleton and then to determine which of the many needed departments were the ones needed most imperatively, leaving to the future the completion of the system.

Another impediment to immediate establishment of ideal conditions was that during the twenty-five years in which Illinois had no progressive and constructive policy there was being created very little popular interest in sanitary affairs. The local health organizations were, as a rule, operating with most niggardly appropriations and with very little public cooperation. The people, as a rule, and particularly the municipal and county governing bodies, were not ready for radical changes or for decided activities in public health reform. It is not necessary to remind this audience of the difficulty in forcing sanitary activity far in excess of the public knowledge or the public desire.

Under the circumstances it was quite out of the question to secure the creation of county health officers employed by the individual counties and, even if this could have been attained, it did not answer what the state board of health regarded as the most important thing in the earlier stages of reorganization. The essential thing was a closer personal supervision of the various localities of the state, but this intimately connected with the central state organization.

In the drafting of the original plan it was not known what the appropriations would be, and the method of hitching up the various communities with the state board of health had necessarily to be an elastic one, which could be altered from year to year as available means permitted.

The plan adopted was the division of the state into sanitary districts, with the employment in each district

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

of a full-time medical health officer in the employ of the state. Such officers were to be selected by civil service and were to be required to reside at convenient points in the districts assigned to them and each district health officer was charged with a general supervision over the health conditions of his district and with certain specific duties.

Acting as chief sanitary officer, having general supervision throughout the state, the plan contemplated a state epidemiologist, who should perform the usual functions of an epidemiologist, but who would likewise keep in general touch with the health officers in their several districts.

When the appropriations were finally completed, it was found that the state could be divided in but five districts. For a large state like Illinois, this was a very modest beginning; but it paves the way for future development. The districts are outlined at the discretion of the state board of health and their boundaries may be made very elastic. With larger appropriations and with the employment of more health officers, the state may be redistricted without resulting complications and, even under the present conditions, readjustment of boundaries may be made, guaranteeing that no one officer will be idle part of his time while another will be overworked with the demands of his district.

It is the avowed aim of the state board of health to secure a full-time medical health officer for each county of the state. Whether such an officer will be paid by the county or by the state will depend on future legislation. However that may be, the present small quota of district health officers will pave the way for the desired end.

It is possible that county health officers will be finally attained by the division and subdivision of the present districts until the county unit has been attained as a part of the state organization. In this event, the creation of these first districts is a direct step toward the end.

On the other hand, the present district health officers, in coming in close contact with the various communities, are demonstrating the value of trained and efficient guidance, conducting, if you will, an educational campaign which will tend to make all of the counties of the state more favorable to the employment of full-time medical officers of their own.

Further, in the condition of relative disorganization prevailing in most of the local communities, the district health officers are assuming a direct supervision which will grow in force and effectiveness and which will very naturally continue over the county health officers if they are appointed. It has appeared to me that it is far easier to assume a lasting, rigid supervision on the part of the state at this time than it would be if the full-time county health officers were fully established before the creation of the state districts.

In this way we feel that the small group of district health officers now employed in Illinois constitutes a long step toward efficient local health supervision. To us it seems more logical to have the sanitary supervisory forces within the state ramify out from the state board of health and to extend unbroken to the very doors of the cities and villages than to have the health organizations develop in their own way in the various localities and center in toward the state board of health. The former plan promises much greater uniformity in local methods and a much greater influence of the state board of health over the various communities in time to come.

In a way, the district health officer is the general representative of the state board of health in his district. He is more than a mere sanitary officer or epidemiologist. His duties and his functions are practically as broad as those of the state board of health itself. He is supposed to represent, in his community, every departmental or bureau of activity of the board. He is the means of communication between the outlying state and the central state health organization.

Primarily, he is supposed to familiarize himself with the sanitary conditions of his district and he is expected to abate insanitary conditions. In this he does not act alone. He is in close communication with the new state bureau of sanitary engineering and that bureau cooperates with him in every way.

He is expected to take action in the suppression and prevention of communicable diseases and to settle mooted diagnoses in such diseases. In this, however, he has ever available the services of the state epidemiologist and the cooperation of all of the state diagnostic laboratories.

In his relationship with the diagnostic laboratory system of the state, he will see to it that the laboratory stations in his community are efficiently managed, that laboratory containers are always on hand, and he will supervise the distribution of free supplies of typhoid vaccine, diphtheria antitoxin and other curative and preventive serums and agencies through the stations in his district.

In addition to this the state board of health has established in each sanitary district a branch diagnostic laboratory so that each district health officer has a laboratory near at hand on which he may call to meet his special needs.

In putting in operation the new Illinois Birth and Death Act, involving the employment of 2,896 local registrars, many of whom are quite inexperienced in their duties, the district health officers prove of inestimable service in giving instruction to the registrars, and it will be their further duty to see that the provisions of the act are fully complied with in their districts. Hence the district officer becomes the connecting link between the local registrars and the Bureau of Vital Statistics.

In the selection of district health officers under civil service, ability as public health educators was given definite consideration. The district officer is supposed to cooperate with local public and private agencies, with women's clubs, commercial associations and medical societies in every form of public health publicity and education, and it is through the district officer that arrangements will be made for the various exhibits, motion pictures, and educational publications supplied by the board and for the public speakers who are available for public meetings.

As far as possible the people of the various districts are made to feel that their district health officer is the one to whom they will look for advice, guidance and assistance and the officer himself is made to feel that he is personally responsible for the well-being of his district and that he has at his command every facility of the state board of health. Reports of communicable disease, formerly made direct to the offices of the board, will now pass through the hands of the district officer, that he may receive first-hand information relative to those conditions in the control of which he is especially charged.

This does not mean by any means that the several district health officers are to be left to bear their own responsibilities and to shift for themselves in their more or less isolated communities. It means that information relative to the various localities will be brought together and will be given some intelligent significance instead of being dumped into the central offices of the board from a thousand and more different sources. It means that instead of everything going to the central offices of the state board of health in a hit or miss fashion, the board is extending itself throughout the state. It means that there are convenient centers throughout the state where an agent for the state board of health, fully empowered to take immediate steps in the name of the board, may be readily reached.

The district health officer is expected to maintain an intimate relationship with all of the local health officials in his district. He is expected to visit them as often as possible, whether an emergency exists or not, and to advise with them not only in regard to the abatement of the existing insanitary conditions, but in regard to a constructive sanitary policy for their communities. I think that you will agree with me that a great many reasonably intelligent physicians and laymen serving as health officers are inefficient because they do not recognize the essentials of good public health administration. By a close, friendly relationship the district health officer should be able to elevate the standards of health administration in his cities and towns and this should be further brought about by health schools or health conferences to be held at a central point in each district at least twice a year. As a result of these district conferences it is expected that the district health officer will be able to stimulate interest which will contribute to the usefulness of the sanitary and public health conference or school to be conducted each year for the state at large.

Particularly in the line of constructive sanitation and educational endeavor it is believed that this group of health officers, each with his own particular district, may develop among themselves a friendly spirit of rivalry and competition which will result in a considerable amount of good. It will be comparatively easy to determine the amount of constructive work done in each district and thereby to establish standards of what constitutes average efficiency on the part of the individual officer.

The group of health officers, while normally confining their activities to their own districts, will constitute a mobile force, which may be concentrated in any section of the state in time of emergency, giving to the state board of health a staff of thoroughly experienced men who have been accustomed to meet the problems of all classes of communities.

After having the district health officer plan in operation only a short period of time, we feel in Illinois that it is the logical basis for the development of an extensive and intensive public health system and we are impressed that whether or not county health officers are employed in the state, the district health officer will remain an important factor, keeping in close touch between the state board of health and the people in the communities whom it strives to serve.

ABSTRACT OF DISCUSSION

DR. H. M. BRACKEN, St. Paul: A connecting link between the state and local boards of health is most important. The local board of health is too often out of touch with the state board of health, and too often does not even know what it can expect from the state board of health. The doctor has spoken in favor of the district rather than the county health officer. In this I agree with him. If we try to establish competent county health officers throughout an entire state we would at once be in trouble because we could not find enough competent men. If you can find five good men for five districts you will be doing well at the beginning. You can then easily divide your districts as you have funds and men and finally you may get down to the county as the sanitary district unit. Dr. Drake speaks of a state epidemiologist. Every district health officer should be an epidemiologist. If you are going to depend on a central organization for these experts, there really should be a division of preventable diseases in the state board of health with a group of epidemiologists, not a single epidemiologist. The district health officer should be acting under the authority of the state board. He should be an adviser. He should be in close touch with the various local health officers. District conferences should be held each year. Nothing can be of greater value in an educational way than these practically local conferences, for with them you come in direct contact with the people who need education in matters relating to sanitation. The civil service examination is possibly a necessity. It is fortunate that the U. S. Public Health Service is willing to help out on this. I belong in a state where we have been able to select good workers without political interference, and therefore we have not needed the civil service examination.

DR. B. FRANKLIN ROYER, Harrisburg, Pa.: Those of us who have watched from a distance, and occasionally from closer range, the public health work in Illinois have appreciated the need of the new scheme of organization. In fact, as much as six years ago several persons from Illinois, medical men who were members of the legislature of that state, had long conferences with us looking toward some scheme of reorganization and drafting of new legislation. The scheme of district health organization seems to have been planned with more thought in Illinois than in most states. Possibly Massachusetts was the first to utilize the district method. It was provided for in the Pennsylvania law and never put in practice; and is provided for, I believe, and in practice in the state of New York and in Maryland. After having watched the operations in Pennsylvania for a period of eight years, operating with a county representative in each county, paid by the state for such portion of his time as he gives to the work, I am not as enthusiastically in favor of districts as are some persons. I feel that the district scheme adds very materially to the central office organization. It is not essential that the supervisor actually reside in the district. It is essential that you have enough medical men connected with your central office to properly supervise field work, to properly supervise the county officers and through them the local boards of health in each county. Some of these central office men will certainly be in the field but without residence in the district. The state of Pennsylvania in 1907 made a somewhat radical departure. The first step made by the legislature was to wipe out boards of health in townships having a population of less than 250 to the square mile, and the state department took complete supervision over those townships through the county inspectors, appointing local health officers for the rural district under them. Sometimes one health officer covers several townships, and sometimes only one township, depending on the population. These are called sanitary districts. These officers are under the county inspector, and the county inspector in turn under the central office organization. Later in 1913 the law was amended, giving more specific methods for taking control. At the present time if a borough does not maintain an efficient board of health, if for any reason the local board resigns, or if the work is done in any way that is a danger to the outlying community, the state department sets aside the board and administers the laws in that municipality, the same as it does in the township all around it, and this work is done at the expense of the local treasury. Today we are doing the work in 150 such communities. Nearly every week some additional small community having trouble to maintain a local board of health asks us to take over the administration at their expense. We shall certainly come more and more to the

point of centralizing our public health administration, and these small units of population that organize as boroughs, in order to indulge themselves in various municipal improvements, waterworks, street paving, and what not, and are organized chiefly for that purpose, will let their health administration remain under the responsible county authority or state authority or district authority. Few municipalities having a population under 10,000 will do their own public health work well. Probably most public health workers will even place the population higher than that.

DR. J. N. HURTY, Indianapolis: What salaries are paid these five district officers? Does the State Board of Health of Illinois expect or desire to increase this number of district inspectors until finally, perhaps, every county as a unit would have its county health officer?

DR. W. J. DENNO, New York: In 1913 a complete reorganization of the state department of health was provided for by what is called the Model Public Health Law. It provided that the commissioner could establish certain divisions: administration, child hygiene, communicable diseases, sanitary supervision, vital statistics, sanitary engineering, and additional ones if necessary. It also provided that he could divide up the state into as many sanitary districts as he saw fit, not to exceed twenty. The state was divided in 1914 into twenty sanitary districts, and twenty district supervisors were appointed. They were appointed by civil service examination. It has developed cooperation with the local health officers, and by the way, there are about 1,100 local health officers in New York state controlling about 1,400 health districts. Each sanitary supervisor has approximately fifty-five health officers under his supervision, and establishes close and cordial relations with them, gets to know them personally, knows the problems of the district, and is able by cooperating with them to obtain results that the local men cannot obtain, because they are restricted not only by local conditions, but by fear of pushing matters that they know should be pushed. But, with the backing of the state representative by throwing the responsibility on the state, the health officer is able to get results. The supervisors are valuable in the routine work, and even more valuable in emergency work. Through the sanitary supervisor, it is also possible to bring to the local health officers a knowledge of the assistance that can be obtained from the central organization.

DR. L. R. WILLIAMS, Albany, N. Y.: A year ago we had introduced into the legislature a bill providing for the appointment of county health officers. The 1,100 odd health officers promptly saw that that was an attempt to remove a certain number of them, and they objected very strongly. Through their organization, known as the State Sanitary Physicians' Association, the bill was tabled. We then put in a substitute bill which passed the legislature, and that was to give the different towns and villages the authority to join into a consolidated health district. We have endeavored during the last year to consolidate a number of health districts, so instead of having 1,443 health districts, we now have about 1,350. Perhaps we may finally get a district large enough to have a whole time health officer, and five districts may be consolidated into one county unit. That has seemed to us a great deal better than establishing the county system at once where we have a large number of counties and where we find it impossible to get suitable men to fill those positions.

DR. HURTY: What salary do you pay the district officers?

DR. WILLIAMS: We pay $3,000. The local men get paid 10 cents per capita per annum for the people they serve in their local districts.

DR. C. ST. CLAIR DRAKE, Springfield, Ill.: I have felt that the district plan is better adapted to state health administration than any of which I have knowledge and, in addition to considerations of greater efficiency, I am sure it offers better hopes of easy attainment than does the county health officer plan. As in Illinois, you can begin in a modest way, with five or six districts and gradually work up to an organization which will give you a full-time, well-trained health officer to a district equivalent to two or three ordinary counties. About forty-five health officers could properly perform the service for the 102 counties in Illinois.

DR. J. N. HURTY: Then you feel that one officer for every two counties would be about right, instead of one for every county.

DR. DRAKE: Yes, about one officer to every two or three counties, depending largely on the area and population of the counties embraced. The selection of district health officers is of course a matter of great importance. Governor Dunne of Illinois readily acquiesced in the suggestion that the officers for this important service should be selected through competitive tests conducted by the Civil Service Commission with the assistance of competent health authorities. In approving the suggestion he said: "Let us have the best the country affords, the welfare of the people demands it and, furthermore, what better political asset can any administration have than an active, efficient health department absolutely divorced from politics."

Dr. Hurty has asked about the remuneration provided for district health officers. In Illinois we have started these men at $1,800 per annum, but in my recommendations to the Civil Service Commission I have indicated that it is desirable to permit a range of increase to $2,800 per annum without the requirement of further examination. Beyond that point I believe a promotional examination or an efficiency test should be required.

Some one has questioned the necessity of having an epidemiologist when the service is organized as I have outlined, the argument being that all district health officers should be qualified to act as epidemiologists. In a measure this is true, but I am of the opinion that the whole service is greatly strengthened by having a man of unquestioned ability in epidemiology, a man whose skilled services are available on call of any member of the field medical service. The district health officer is more of a general health officer, the epidemiologist is a specialist. I very much doubt the possibility of securing any considerable number of men of the desired quality if skill in epidemiology is made a preeminent requirement. Another point raised in the discussion relates to the requirement that district health officers shall reside in their districts. This requirement is, I feel, vital to the success of the district organization. Availability is a most important consideration. Then, again, an officer who is a resident of his district is more likely to be looked on with favor than is one who comes into a district only to discharge official duties. A resident officer will have more influence with the people of his district than will a nonresident; he will have greater pride in his district and doubtless will have better acquaintance with its needs.

THYROID DISEASE IN RELATION TO RHINOLOGY AND LARYNGOLOGY *

B. R. SHURLY, M.D.
DETROIT

Clinical medicine has stamped forever an indelible impression on our specialty. The trend of modern education with demand for higher standards, a longer curriculum, better teaching and more hospital work has forced on us a special training that carries us more and more into special surgical fields remote from internal medicine.

It is imperative that our training as special nasal, oral, pharyngeal and laryngeal surgeons shall not rob us of a keen interest in the problems of diagnosis in relation to general medicine.

A few decades ago our ranks were filled by the general practitioner alone, while the higher standards of today require the development of special surgical technicians. This differentiation of specialism has progressed so rapidly that we find among us a few who devote their time exclusively to one subject, such as intubation, bronchoscopy or hay-fever.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

The anatomic position of the thyroid gland, its functions, and correlations with other ductless glands places it necessarily among the subjects of great interest to the laryngologist.

As our problems of disease in the nose, throat and ear, whether surgical or medical, are dependent fundamentally on problems of immunity, infection, the action of the vasomotor centers and the influence of a balanced biochemistry of internal secretion, it is necessary that these principles of physiology and pathology, as applied to our specialty, should be constantly before us.

My particular interest in a study of the pathogenesis of internal secretion in this special field arises from the fact that the State of Michigan is within a well-defined geographic belt where thyroid disease is observed in an increased number.

Goiter, thyroid disease and the various manifestations of pathology in the ductless glands may be classified within the selected sphere of many specialties, yet it is the ophthalmologist or laryngologist who is called on for his opinion in many incipient forms of ductless gland disturbance.

The fault is no doubt ours that we fail to recognize as a syndrome the earlier signs of excessive or deficient secretion. The findings and symptoms in relation to the upper respiratory tract are of sufficient interest to attract our attention and lead to further investigation. In this connection it is frequent to find the atypical forms overlooked or passed into that graveyard of diagnoses, psychasthenia, neurasthenia, catarrh, indigestion, anemia or a run-down condition.

Scientific diagnosis and therapeutic selections of great value to the patient may be offered in appropriate atypical forms of disease.

The comfort and welfare of the patient suffering from symptoms referred to the upper respiratory tract may depend daily on the amount and character of secretion from the ductless glands. The example of hyperthyroidism with excessive secretion of the iodized protein thrown into the blood or lymph stream and the attending phenomena elicited are common observations.

Under the marvelous regulating functions of the vasomotor centers, the various ductless glands may undergo a compensatory hyperemia or hypertrophy, singly or in harmony with two or more corelated glands. The thyroid in particular is frequently disturbed in ratio with the suprarenal. The simple goiter of girls at puberty, with disturbed emotional states attending an insufficient iodin feeding, is an example of transitory influence.

The exacerbation at the menstrual period with hysterical or neurotic throat symptoms is frequently called to our attention. While this condition is usually passing and remedied by rest and outdoor life, the simple goiter is occasionally a forerunner of serious thyroid trouble in later life.

It is manifestly obvious that the physiology of the thyroid and other ductless glands is profoundly affected by toxic disturbances in general and especially by those that enter the tonsillar chain of lymphatics.

We are familiar with the increased consumption of oxygen in thyroid or suprarenal feeding and the effects on the heart centers and metabolism. The average amount of iodin in the normal thyroid is estimated at 3 mg. per gram of gland substance; to utilize it is not to destroy it, as iodin is reabsorbed in a process of auto-activity. It is especially our function as laryngologists to realize the direct and definite physiologic and pathologic relation of the tonsils to the thyroid and to establish a routine investigation of the effects of tonsillitis, quinsy and other infections of lymphoid tissue on the upper respiratory tract. My attention was called to this subject by the beneficial results of a series of tonsillectomies for the relief of recurrent tonsillitis and quinsy, attended by incipient typical and atypical exophthalmic goiter. The prompt, permanent and prophylactic value of enucleation in this class of cases adds another definite indication to surgical procedure which is given no attention in the literature. As acute and chronic tonsillitis and peritonsillar abscess are recognized as important etiologic factors in incipient exophthalmic goiter, tonsillectomy may be classified then as a prophylactic measure in our new and fashionable department of preventive laryngology.

While it is the purpose of this paper to limit discussion to the thyroid gland and its relation to the upper respiratory tract, a fascinating and scientific field of research is developing in contributions to the interrelation of the tonsils with the suprarenals, pituitary body, thymus and ductless gland system in general.

The diagnostic signs of differentiation according to the degree of hyperthyroidism or hypothyroidism established have been definitely classified by Beebe and Rogers as follows:

HYPERTHYROIDISM.—More common in young women from 18 to 30 years. Onset may be slow and gradual or sudden and acute. Tachycardia from 128 to 180; pounding beat felt over a wide area; often a loud systolic murmur over apex, base and along the great vessels. Irregular form, and very susceptible to the effects of exercise. Blood pressure variable, generally low, pulse soft and full, marked dyspnea on slight exertion. Marked edema of legs.

Nervous System.—Fine tremor affecting nearly all the muscles, twitching and occasionally spasms. Patients are abnormally irritable and excitable, apprehensive, mentally very active and physically restless. Muscular weakness prominent.

Eye Signs.—Exophthalmos generally present, although it is not invariable. Occasionally unilateral, corresponding to the side having the enlarged thyroid lobe. Various symptoms arise in consequence of the exophthalmos. No pupillary changes.

Gland.—Enlargement varies from nothing to very large goiter. The blood vessels over the gland are generally much enlarged and pulsate markedly. Right lobe generally the larger.

Nutrition.—Severely disturbed; in most cases there is a loss in weight which may progress to extreme emaciation. Appetite variable; vomiting and diarrhea frequent complications. Patients drink a great deal of water.

Skin.—Profuse perspiration, erythema, urticaria, dermographia; pigmentation, which may occasionally be so marked as to suggest Addison's disease. Hair falls out, but is not coarse and dry. Patients prefer thin clothing and cold rooms. They are more comfortable during cold weather. Temperature may be only slightly elevated, 99 to 100. In severe acute cases it runs often to 102 or 104.

Urinary Findings.—In most cases normal in volume; glycosuria not unusual; polyuria often observed in later stages. Nitrogen proportions show a very much decreased creatinin excretion, while creatin is present in large amounts. Nitrogen is marked during the period of emaciation. Blood: Hemoglobin low. Leukopenia in severe cases, with a marked relative lymphocytosis. Menses very irregular or completely suppressed.

HYPOTHYROIDISM.—More common in advancing years from 35 to 50. Onset slow and gradual, in many cases engrafted on an old Graves' disease. Heart, rarely above 100, may be irregular, with heaving impulse. Pulse generally shows high tension and the blood pressure is above normal. Nervous system: Patient may have some tremor and muscular weak-

ness is likely to be very pronounced, but there is not the same restlessness and jactitation. Patients are occasionally irritable, but they are generally dull and apathetic; mentally slow; memory defective. Pains in joints frequent, and referred to as rheumatism; there is a marked tendency toward sudden giving way of the legs when walking.

Eye Signs.—Exophthalmos is unusual, although it may have been present at one time. Gland: Often no enlargement can be made out; when there is a goiter it has an elastic, rubber-like consistence, occasionally cystic and nodular, but very distinctly different from the active pulsating gland of exophthalmic goiter.

Nutrition generally not seriously disturbed; patients hold their weight and in most cases gain slowly; constipation, rather diarrhea and flatulency are a troublesome habit. Patients do not drink much water. Skin dry, may be scaly; patients do not perspire on exertion; hair and nails dry, brittle, and scalp scaly. Pigmentation not common. Patients prefer thick, warm clothing and are cold most of the time. Much more comfortable during hot weather. Temperature subnormal, may reach as low as 95. Urinary findings: Albuminuria is not unusual. Nitrogen proportions do not show so marked a disturbance in creatinin and creatin ratios. In large number of cases urine practically normal. Blood: Hemoglobin low, white blood count normal. Menses generally regular but scanty.

While the degree of hyperfunction is in no relation necessarily to the size of the thyroid, it is interesting to note that the family tendency, as brought out in the hereditary story of thyroid, cardiac or nervous disease, is frequently an important influence. The history of infection, shock, fright, overwork, great fatigue, mental strain, worry, or accident, will often mark the onset of an atypical or severe exophthalmic goiter.

As laryngologists, we are ever alert to the influence of systemic disease on the structures within our chosen fields of observation, yet we are prone in the hurry of routine office work to thrust aside deeper investigation. The unstable vasomotor nervous system, gout, rheumatism, neurasthenia and autointoxication, especially, render the subject liable to annoying symptoms in the nose, throat or ears.

Some of these cases may be classified and identified as thyroparathyroid insufficiency and appropriate treatment may be given with relief. We recognize marked cases of cretinism, infantilism and exophthalmic goiter or senility, for example, without difficulty, but the considerable number of atypical forms of disease of the ductless glands with perverted secretions and attending pathologic change and discomfort in the nose and throat pass frequently without further investigation.

Attending enlargement of the thyroid, the rhinologist is called on to recognize or suspect tumor of the hypophysis or change in the anterior or posterior lobes. As Sajous has stated, it is not alone in acromegaly that typical signs of impaired functions of the posterior pituitary appear, but in other syndromes directly ascribable to the suprarenal system, as myxedema, cretinism, Graves' disease, and Addison's disease, which include in the aggregate the majority of organic changes of a morbid kind to which the system is liable, besides nervous phenomena.

The effects of thyroid toxemia and deficiency on the nervous, muscular and cardiovascular system are so serious that we may find special and early symptoms in the upper respiratory tract.

When the routine examination of the nose, throat and ears includes the cervical and postcervical glands, thyroid and thymus, it may be possible to abort an incipient case of Graves' disease or of pulmonary tuberculosis. These conditions are frequently associated with low resistance to infection.

Our observation may include the size of the hypertrophy, consistence, shape, one or both lobes, diameter of the neck, pulsation, or bruit. We may verify our suspicions before referring the case to the internist for diagnosis. The pulse will be observed as to rate, quality, arterial tension and effect of exercise. The nervous symptoms especially are those of tremor, twitching, jactitation, insomnia, dreams or disturbed mental condition. We may also find dry or moist skin, dry, dead, or falling hair, brittle nails, pigmentation, eruptions, dermographia, dyspnea, fatigue, nausea, and fever.

Again we may return to the symptoms and signs in detail, as observed in our special field.

In moderate or severe thyroid insufficiency we may find a dry mouth and throat increased with excessive dyspnea on exertion; voice, husky or thick, muscles of throat tire more easily; defects or changes in speech. The mucous membrane of the lips, mouth, tongue, pharynx or larynx may be swollen and dry. The laryngeal muscles may show insufficiency.

Matthews has reported 289 cases of laryngeal paralysis in 1,000 cases of goiter, seventeen of which were bilateral. In my experience a number of cases have exhibited slight motor insufficiency, according to the size of the goiter and the varying degrees of pressure. It would seem to me that as many of these cases have passing insufficiency it is scarcely tenable to term this condition laryngeal paralysis. It is quite remarkable that a change in voice is not necessarily in proportion to the degree of insufficiency.

Perversion of taste may occur. Howard observed six with abnormal taste in a series of thirty-two cases. Hume and Prudden report as high as one third abnormal after a careful testing of the sense of taste. Those occur usually in hypothyroidism.

In exophthalmic goiter taste, smell and hearing are rarely affected. In severe deficiency of thyroid secretion, hemorrhages from the nose, throat or gums are common. The amount of dyspnea may simulate cardiac or pulmonary disease of severe type. This modification of the oxygen supply due to the suprarenal insufficiency may bring about a marked effect on the hair, nails and skin.

Dyspnea in hyperthyroidism occurs after damage to the heart muscle has occurred. In myxedema we occasionally observe an infiltration of the nasal mucous membrane followed by thickening and occasional obstruction by a gelatinous, waxy, or yellowish secretion. This may be attended by symptoms of a cramped and swollen feeling in the throat. Pharynx and larynx may assume a bluish tinge or earlier a pale, yellowish color. Angioneurotic phenomena occur with relaxed or elongated conditions of the uvula. The interarytenoid fold may be transparent.

The dry and husky throat of Graves' disease may be attended by symptoms of cough, fever, unilateral bruit, loss of weight, precordial pain, apprehension and anemia, which may lead to a suspicion of mistaken diagnosis of pulmonary tuberculosis, and call in proper differentiation. In exophthalmic goiter hyperemia of the pharyngeal, bronchial and pulmonary mucosa is common.

The thyroid gland under hyperfunction is often hard, and in this condition gives rise to greater pressure, which is frequently the exciting cause of tracheal cough. This may be modified by change of position

and improve with a softer consistency of the gland. Some of these cases exhibited periodicity in their intervals of exacerbation and quiescence.

The abnormal psychic condition of the individual on his discovery of an enlarged thyroid gland immediately assumes a serious phase of apprehension unless he is managed with great care and foresight.

As apprehension is one of the predominating symptoms, it is often possible, without very great care, to alarm these individuals and produce a serious hypochondriac condition.

In considering the therapy of thyroid disease in general, it is understood that the great majority of drugs are entirely useless except when occasionally indicated for the control of special symptoms. An enormous number of therapeutic measures have received the endorsement of many splendid physicians. It is, therefore, a question of serious consideration to know what we can do for these patients that offers something of value.

The therapeutic measures which we adopt at the present time are those selected by elimination after a study of these patients for many years. Rest and often a change of environment are absolutely essential to the ultimate control of thyroid disease. Psychic control and management, together with sedative therapeutic suggestion, is of untold value. The question of success in the treatment and recovery of incipient exophthalmic goiter will frequently depend on these two essentials.

In myxedema, and particularly in the atypical forms, great relief and permanent improvement are usually attained by a careful plan of administration of thyroid extract and iodin in carefully selected dosage of carefully selected preparations. The action of the thyroid protein is specific and within the realm of prompt observation. The secretions of the myxedematous throat and nasal passages become greatly improved, and the combination of the thyroid proteins of Rogers, the proteins of pancreas or suprarenals and iodin will frequently bring about striking improvement. Proper use of the galvanic cautery, the anode electrode applied along the cervical sympathetic and the cathode applied to the neck, with a 1 ma. current gradually increased, is often attended by an improvement in the consistency and size of the thyroid.

Operative interference, either ligation or enucleation, should not be postponed in cases in which medical treatment does not show improvement after a reasonable time. The results depend greatly on the skill of the surgeon, as a number of serious results may testify. The use of hypodermic iodin or the green citrate of iron is often of great service in rendering the vasomotor system more stable. Many cases of the myxedematous type improve greatly under the administration of pure iodin. The study of the individual cases alone can definitely determine this problem.

The internal secretions and their relations to pathogenesis, physiology, and therapeutics deserve our most serious study. The rôle which they assume as oxygen carriers and active principles of stimulation to the blood cells of the body deserve our interest. Their rôle as immunizing and sensitizing agents is worthy of increased scientific interest. Their influence as governors over the vasomotor centers and regulators of harmony in the functions of the lymphoid tissue of the throat is indeed significant.

We are unable as specialists to unravel many of these great mysteries of biochemistry. We must call on our laboratory colleagues with the spirit of research and untiring devotion to scientific investigation to solve these problems for us. Individually we can offer only our clinical mite. Yet it would seem that the laryngologist and the otologist have sufficient interest in the newer fields of organotherapy and pathology of the ductless glands to demonstrate that the thyroid and the tonsillar ring are involved in such a delicate and complex interrelationship that our special opinion in this field of research may, we hope, soon prove sufficient to call the attention of the internist, the neurologist, and the general surgeon to the fact that an examination of the nose, throat, ears and larynx is at least, in all modesty, worth the effort.

AUTOGENOUS COLON VACCINES IN THE STUDY, DIAGNOSIS AND THERAPY OF CHRONIC INTESTINAL TOXEMIA *

G. REESE SATTERLEE, M.D.
NEW YORK

Chronic intestinal toxemia, commonly and erroneously termed chronic intestinal stasis, has always been a widespread and frequent complaint. It has had a variety of names, but one of the earliest is by Robert Burton[1] in 1676. It was characterized by him as "windie melancholie," a name that could scarcely be bettered today.

What the ancients did not know about pathology they made up in therapeutics. Pliny,[2] in speaking of this disorder, said: "Simple diet is the best; heaping up of several meats is pernicious, and sauces worse; many dishes bring many diseases." As to cause, Burton[3] says: "In the first rank of these, I may well reckon up costiveness, and keeping in of our ordinary excrements, which, as it often causeth other diseases, so this of melancholy in particular." Celsus[4] said: "It produceth inflammation of the head, dulness, cloudiness, headache, etc." "In Skenkius' Medicinal Observations there is a story of a young merchant going to Nordeling fair in Germany, who for ten days' space did not go to stool; at his return he was grievously melancholy, thinking he was robbed, and would not be persuaded but that all his money was gone; his friends thought he had some philtrum given him, but Cnelius, a physician, being sent for, found his costiveness alone to be the cause, and thereupon gave him a clyster, by which he was speedily recovered."

Our modern conception of chronic intestinal toxemia is that of a chronic diffuse toxemia of intestinal origin, the result of aberrant biochemical conditions, usually, but by no means always, bearing a measurable ratio to the delay in the onward passage of the intestinal contents as visualized by the Roentgen ray (Lynch, Draper, Satterlee[5]).

The colon bacillus has its normal habitat in the large bowel, where it probably plays an important part in the end of digestion. Researches[6] show that

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Burton, Robert: The Anatomy of Melancholy, Vol. 1.
2. Pliny: Book 2, Chapter 52.
3. Burton: The Anatomy of Melancholy, i, 308.
4. Celsus: Book 1, Chapter 3.
5. Satterlee, G. R.: Chronic Intestinal Stasis, New York Med. Jour., June 12, 1915, ci, No. 24.
6. Conradi, H., and Kurpjuweit, O.: München. med. Wchnschr., 1905, lii, 1762; ibid., 1905, lii, 2165.

the colon bacilli elaborate materials which exert marked inhibitory influences on the putrefactive bacteria in the intestine, particularly the *Bacillus putrificus-coli*, and in this way prevent the origin of intestinal autointoxication. Carbohydrate oxidation and fat decomposition; fermentation, not putridity, are caused by the *B. coli* action. Under normal conditions it lives a saprophytic existence and is not only harmless but beneficial to the host. We will see, therefore, that it is probably for this reason that results from sterilization of the intestinal tract have no lasting effect on the intestinal toxemia when the toxemia is thoroughly rooted in the system. When the colon is diseased, however, the colon bacillus is distinctly harmful, either in the walls of the colon or when lodged in other parts of the body, as the peritoneum, genito-urinary or respiratory tract, etc. It is then capable of becoming pyogenic and its intracellular poison is set free and can then act on the body of the host. Vaughan[7] says the bacterial cell must die to liberate the poison. Deaver[8] states that the *B. coli* isolated from the intestine in case of disease of that structure is more virulent than that from the normal intestine. We quote Adami,[9] who says that under ordinary circumstances the *B. coli* is incapable of forming ectotoxins, but when the intestinal mucosa is affected by traumatism from within or without, the *B. coli* may wander and cause inflammation and thus liberate toxins. It is necessary under these circumstances that bacteriolysis take place through a breaking down and liberating of the resulting split products.

In order to weave the net around the colon bacillus still closer, let us study colon bacillus infections of the genito-urinary tract.

It is the belief of the author that a severe gastro-enteritis or a severe acute disturbance of the gastro-enteric functions is often the starting point and causative factor for the biochemical changes in the intestinal epithelia and the *B. coli* that occur later on in the disease. The condition of chronic intestinal toxemia is not altogether unlike that of intestinal obstruction, in which the intestinal epithelia probably play an important part, as shown by J. W. Draper's[10] experiments of causing the symptoms in animals by feeding heterologous jejunal and ileac epithelial cells. Murphy and Brooks[11] also caused symptoms of intestinal obstruction and death in animals by injecting intravenously epithelial cells of isolated loops of the small intestine. They consider the symptoms and cause of death to be due to absorption of a toxin which is formed by bacterial growth and does not pass through a normal mucous membrane.

From the clinical study of my cases, I believe that after an intestinal toxemia is once established, the effect on all the body cells may be of long duration and that it is not merely a local condition, but a general one. As examples of this, two case histories are of interest.

A man, 35 years of age, felt perfectly well up to five years before coming under observation. After eating some scallops he had a sudden attack of nausea, weakness and cold sweat. He then developed a nervous exhaustion, with peculiar obsessions. After that he had great fear of entering strange places, of traveling and of entering into company, and on this account was about to give up business. He had no appetite, had convulsive retchings at the thought of eating, and constipation and flatulence. He was markedly enteroptotic, and radiographs showed residue in the appendix at the end of seventy-one hours. A diagnosis of chronic intestinal toxemia with secondary nervous system involvement was made. Treatment along these lines brought about improvement, slow at first, but after two months good results and at the end of a year the nervous symptoms had nearly disappeared. During this time the diet was strict and the administration of the colon vaccines in small doses was continued.

The other patient is a married woman, 33 years old, who gives a somewhat similar history of becoming suddenly ill and vomiting on a street car. She attributed this to eating canned salmon the night before. She was also enteroptotic, and developed from that time extreme nervousness, with apprehensions and a peculiar fear of traveling, especially on a street car, which she has not entered since the first illness.

Severe abdominal pains, vomiting, abdominal bloating and insomnia were marked for eight years. These somewhat subsided, but the nervousness and apprehensions still continued. The treatment was to improve the enteroptosis and intestinal toxemia. Autogenous colon vaccines were given weekly, but in four months the results were unsatisfactory, principally because the patient lived out of town and could be controlled with difficulty. Family duties prevented a proper sanatorium treatment.

McWilliams[12] gives the frequency of the colon bacillus in cystitis, as found by Krogius, Morelle, Denys, Melchior, Douglas, Brown, Schmidt and Rostoki, as being a total of 255 out of 370 cases, or 69 per cent. In infections of the whole urinary tract, Escherich found colon bacilli in fifty-eight out of sixty, and Brown thirty-eight out of eighty cases, a total of ninety-six out of 140 cases, or 68 per cent.

Reports of abscesses of the kidney due to ascending colon infections of the urinary tract are very numerous (Barnard[13]). Colon bacilli in the urine are very frequent and harmless unless there is some trauma, irritant or congestion.[12] Enlarged prostates may become infected, due to absorption of colon bacilli from the intestine as a result of constipation.

Chronic appendicitis is a good example for us to study on account of the close relationship and similar construction of the appendix to the large intestine. John Deaver[8] has found that the colon bacillus was the important bacteriologic factor in 90 per cent. of his cases of chronic appendicitis and in 60 per cent. of the cases of acute appendicitis. In these cases it was found in pure culture, much less frequently in conjunction with staphylococcus and streptococcus. It is not difficult to find other authorities for the frequency of the colon organism in the production of acute and chronic appendicitis. Among them are Dacosta,[14] Joyce,[15] Kelly and Noble,[16] Richard Warren,[17] Battle,[18] Mumford[19] and Rose and Carless,[20] in their textbooks on surgery. On the other hand, we have experimental appendicitis caused by the injection of strains of streptococci produced by Edward C. Rosenow,[21] and also numerous other organisms found in the inflamed organ. Among these other organisms might be mentioned the proteus, *B. subtillis, B. capsulatus, B. fusi-*

7. Vaughan, Victor, Jr.: The Journal A. M. A., April 29, 1905.
8. Deaver, John: Appendicitis, Its Diagnosis and Treatment, 1905.
9. Adami, J. E.: Col. Med. Jour., Denver, 1914, xi, 34 to 49.
10. Draper, J. W.: The Journal A. M. A., Sept. 26, 1914.
11. Murphy, F. T. and Brooks, B.: Arch. Int. Med., 1913, xv, 393.
12. McWilliams, Clarence A.: Med. Rec., New York, 1906, lxx, 7.
13. Barnard, H. L.: Lancet, London, 1905, ii, 1243.
14. Dacosta, John: Modern Surgery.
15. Joyce, C. C.: A System of Surgery.
16. Kelly and Noble: Gynecological and Abdominal Surgery.
17. Warren, Richard: Text Book of Surgery.
18. Battle and Corner: The Surgery of the Diseases of the Appendix Vermiformis, and Their Complications.
19. Mumford, James G.: Practice of Surgery.
20. Rose and Carless: Manual of Surgery.
21. Rosenow, Edward C.: The Journal A. M. A., Nov. 13, 1915, p. 1687.

formis, diphtheria-like bacillus, glanders, tetanus, *Coccus conglomeratus*, actinomycosis, pneumococcus and tuberculosis. The pathology of diseased cecums and diseased appendixes differs only on account of the peculiar anatomic structure of the appendix and liability to strangulation and abscesses. The colon bacillus, I believe, is the principal causative factor in the chronically inflamed colons of chronic intestinal toxemia. In our own experience, we have isolated the colon bacillus in pure culture from mesenteric lymph nodes removed with the colon in an operation for reconstruction of the colon. The case was one of long-standing chronic arthritis with severe intestinal toxemia. This case is not included in the case reports of this article, because no colonic vaccines were given. Vaccine treatment would have been given, but unfortunately the patient died four days after the operation from septic peritonitis. She was bedridden from the arthritis and the operation was justified.

The virulence and pathogenicity of the colon bacillus and its frequent occurrence as a cause of chronic intestinal disorders being proved, we must look for means to combat their influence. Diet and proper emptying of the bowels has always been the recognized treatment. Surgery, except in the case of appendicitis, and immunization are new. Among the operations most in vogue are short circuiting, partial or complete removal of the colon, appendicostomy, colostomy and ileostomy. The latter has been shown by Dr. J. M. Lynch [22] to be of great value in selected cases. It was successful in one of the cases reported in this paper.

There has been much said and written about the diet and various methods of stimulating the bowel to proper action. It is a short cut to say that each individual has a separate successful therapy of his own. The diet question needs careful supervision for each individual, and we should take at least as much care of our own human race as we do of our hogs and cattle when we want efficiency and wealth. Whether to feed or starve the patient should be decided for each particular case. We meet many individuals who claim they feel better when their bowels do not move freely; that is like getting accustomed to living in a dirty house; but the real truth of the matter is that these poor creatures have not been free from toxemia for so long that they have forgotten how to live at all. As to diet, I will merely mention that meat and white flour and polished rice should be eliminated. In some instances in which patients do badly on meat-free diet, meat diet is resumed. As to drugs, there are none. This is a place to leave out drugs, save for temporary expedients only. Cathartics are useful at times; laxatives, very infrequently. Liquid petrolatum is a compromise, and we all have to use it; frequently it is the cause of keeping up a toxemia on account of its impurities. After diet, hygiene and habits, we have left two things, immunization and surgery. I place immunization first, as some day it may diminish the number of necessary abdominal operations.

If the colon bacillus does play so important a rôle in this trouble as we think it does, the logical thing to do is to supplement our routine therapy by vaccines or serum. The serum so far is not very practical on account of the extreme toxicity the colon bacillus has on animals. This is, moreover, a chronic process and time can be given to the body to form its own antibodies.

22. Lynch, J. M.: Personal communication to the author.

Autogenous colon vaccines have not been used very extensively. They have been given in colon infections of the genito-urinary tract with more or less success. Stock colon vaccines are used extensively, but are of little value on account of the large number of types of the colon bacillus. Chvostek[23] has given colon vaccines by mouth. Living cultures of the colon bacillus have been given into the lower bowel by Bassler[24] with reported good results, but the rationale is uncertain. Turck recommends the subcutaneous injection of autogenous colon bacillus vaccines as of the greatest value. The cultures should be taken from the feces or colonic washings. Turck's[25] technic is to give subcutaneous injections of from 50 to 100 million bacteria and run the dosage up in ten days to 500 million or even to 1,000 million. Turck also mentions a modified vaccine method by injecting the autogenous colon bacillus culture into a fetal pig. After incubation of twenty-four to forty-eight hours the serum is pressed out of the fetal pig, centrifugalized and the micro-organisms destroyed by fractional sterilization and the serum thus obtained injected in small quantities. He does not, however, give any case histories or statistics.

Vaughan[26] immunizes guinea-pigs and rabbits by first splitting up the cellular substances of the colon bacillus into a poisonous and nonpoisonous portion by means of dilute sodium hydroxid. He then injects the nonpoisonous substance into the animals and immunizes them to at least eight times the fatal dose of the living germs. The serum thus obtained might be of use in immunizing human beings. Turck mentions thyroid substance as being of use in treatment to increase the antibodies against the colon bacillus. This has helped in some of my cases, but there is danger in reducing the weight of the patient.

For the control test in the diagnosis of colon bacillus infections, the serum agglutination test would be very valuable if it were reliable. Bennett, in his work with us on this subject, has found that the serum of other individuals not suffering from toxemias of colon origin agglutinate also the colon bacillus. Dudgeon[27] found that the blood serum of a patient who has a hemic infection with the *B. coli* may not agglutinate the colon organism. In a long series of cases, Dudgeon found that it was extremely rare to obtain a well-marked agglutination reaction. For this reason, agglutination tests have not been continued on my cases. The opsonic index is also unreliable and difficult. Leukocyte and differential counts were done on a number of the early cases, but were discontinued, as no change after the vaccines was demonstrable. The conclusion is that the index of improvement is the patient's general improvement in the color of the skin, abdominal symptoms, the disappearance of crepitation, tenderness and splashing, the disappearance of the headache, neuralgias and myalgias, and above all, the mental improvement.

The finding of colon bacilli in the blood is not necessary for the diagnosis of infection by this organism; if we had to wait for that we might never make a diagnosis, because it is very infrequently found. What we have to contend with is not the number of colon bacilli, but the virulence of the organism, and the degree of resistance of the individual.

23. Chvostek: Wien. klin. Wchnschr., April, 1908, xxi, 453.
24. Bassler, A.: Med. Rec., New York, Sept. 24, 1910, lxxviii, 519.
25. Turck, Fenton B.: International Clinics, 1911, xi, 45.
26. Vaughan, Victor, Jr.: Jour. Med. Research, Vol. xiv, No. 1, 67.
27. Dudgeon, Lancet, London, 1908, 1, 616.

TECHNIC OF ADMINISTRATION OF VACCINES

The initial dose is from 10 to 25 million of the dead bacteria subcutaneously, depending on the amount of toxemia in the individual. This dose is repeated at intervals of every four to seven days. The dosage is gradually increased by 25 million each time until the maximum of 200 or 300 million bacteria is reached. Relief of symptoms is not usually obtained until three doses have been given. Occasionally quick response is seen and sometimes two months are necessary. In most uncomplicated cases three months of treatment gives permanent relief.

In those patients who have a relapse, quick response to vaccine injections is usually seen. In very obstinate cases it may be necessary to continue the vaccine treatment for a year or more.

A reaction after the injection of the vaccine usually occurs. This consists of a local redness, the size of a fifty-cent piece, pain and swelling at the site. In a severe reaction this swelling spreads until the whole upper arm is involved. This local reaction begins in six to eight hours and lasts twenty-four to seventy-two hours. At the same time a general reaction takes place. A brief description of this is that there is an exaggeration of all the symptoms: headache, malaise, vertigo and occasionally nausea. A decided increase in the severity of neuralgic or myalgic pains and of pain, soreness or discomfort in the abdomen, if these symptoms had been present. This reaction is followed by decided relief of all the previous toxic symptoms.

In markedly toxic cases if an active colon organism from the diseased part of the colon has been obtained, early reactions are severe. The reactions have usually been severe in most cases in which excessive doses, such as 300 to 1,000 million bacilli, have been administered.

In those cases in which no reaction is obtained the cause may be (*a*) attenuation of the organism from which the vaccine has been made; (*b*) previous immunization of the patient, as after prolonged dosage of vaccine; (*c*) mild degrees of toxemia, or (*d*) absence of colon bacillus toxemia in the body. In the last-stated cause the vaccine becomes of value in diagnosis.

In no case of profound intestinal toxemia, as yet, has there been a complete absence of reaction following the administration of the vaccine. The converse also holds good, that in no case in which a sharp local and general reaction has taken place could we exclude chronic intestinal toxemia.

Loose bowels and intestinal evacuation have occurred in quite a few instances, following the vaccine injections, and improvement continued. For the diagnostic value of focal reactions following vaccine injections, I refer to Noble P. Barnes.[28]

The following classification for the use of autogenous colon vaccines has been suggested by the author's success in the vaccine therapy: (1) mild chronic toxemias which do not respond to diet; (2) all severe chronic toxemias; (3) operative cases, (*a*) before and (*b*) after operation; (4) doubtful cases, as an aid to differential diagnosis.

It is essential to make a thorough study of every case, which includes a radiographic gastro-intestinal investigation. Symptomatology is very important, but we should not take any one's word or personal opinion about the state of his bowels. In numerous instances "absolutely regular bowels" are proved to have large residues. It seems pretty certain to the writer that all patients with chronic intestinal toxemia have had a constipation at some time and that this is a very strong etiologic factor, and also that the laxative habit does not cure, but rather aggravates the toxemia. To prove this we find many "residual cecums," "sigmoids," etc., in patients who have regulated bowels by taking cathartics or laxatives weekly. But these patients have symptoms of toxemia, which are frequently not recognized. Nature often finds its own best relief, so we hear often that "the osteopath has given me most help, but has not cured me." On account of the predominance of nervous and mental symptoms, these people frequently consult the neurologist, who, if thoroughly up to date, should recognize the trouble and institute proper diagnosis and treatment. There are undoubtedly many cases of primary nervous system lesions in which the gastro-intestinal toxemia is secondary. There is every reason that these patients should have the proper care of the toxemia, even if it is a secondary complaint. The insane asylums claim their share of chronic intestinal toxemias. As examples, three of the patients under consideration for this paper had been declared insane and are now well. One patient, an old lady of 76, with the diagnosis of senile dementia, has had the mental symptoms cleared up for weeks at a time by means of dietetic measures and autogenous colon vaccines, which have had remarkable and lasting results.

CASES AND RESULTS

There are sixty-four patients with chronic intestinal toxemia considered in this presentation in whom autogenous colon vaccines have been administered. Forty-seven of these had medical treatment and seventeen operative, seventeen being male and forty-seven female. Among the medical cases, twelve were considered as mild, twenty moderately severe and sixteen severe cases. In all the operative cases, the toxemia was severe. A history of regularity of the bowels was present in eight, of diarrhea without constipation in three, of alternating diarrhea and constipation in four and of constipation in the remaining forty-nine.

Indicanuria was marked in eight (and probably more, as it was not possible to examine the urine very frequently, most of the cases being ambulatory), moderate in twenty-one, normal in twenty-four and there were no records in six. It is noted that in those cases in which indican was a marked feature, the amount found in the urine could be considered as an index as to the change in the patient's condition. Its presence or absence is of no diagnostic import.

In the forty-seven medical cases, thirty-seven showed tenderness and crepitation over the cecum. This symptom, as Coombe describes it, is a feeling as of crunching snow, and often disappears after catharsis and treatment. This sign may extend over the whole colon and I consider it a very valuable symptom of chronic intestinal toxemia and, when present in a chronic condition, it is of diagnostic importance.

I shall not take up your time in enumerating all the symptoms which may be present in this disease, but merely mention the most constant ones found in this series of cases. They were flatulence, abdominal discomfort, and soreness, especially in the right iliac region, headache, mental dulness and inefficiency, and disturbances in bowel movements. Myalgias and neuralgias were very prominent symptoms, occurring in thirty, or nearly 50 per cent. of the cases.

28. Barnes, Noble P.: Paper read before the American Therapeutic Society, June 10, 1916, to be published.

In the sixty-four cases studied for this paper, four were very severe, twenty-two severe, twenty-five moderately severe and thirteen mild toxemias. The cases have also been studied with reference to the degree of reactions after administration of the vaccines. There were seven severe toxemias with severe reactions; five severe toxemias with moderately severe reactions; fourteen severe toxemias with mild reactions, and two mild toxemias with severe reactions. Severe toxemias with severe reactions followed excessive dosage of the vaccine, from 1,000 to 1,500 million bacteria being used. In four cases the original vaccine had to be discontinued on account of the severe reactions, and sensitized vaccines were given instead.

Of the sixty-three cases in which the colon vaccines were used, sixteen had successful terminations or were cured, twenty-one gave satisfactory results, four showed doubtful efficiency, and there was one absolute failure, probably on account of a very incompetent ileocecal valve. In two cases the vaccines were discontinued, one on account of cardiac palpitation and the other on account of persistent headache. In one patient with a very severe toxemia and a large hernia the vaccines gave satisfactory results for one year and were of no assistance the next year, probably on account of the advanced and incurable condition.

In one patient with a chronic gastritis the colon bacillus was isolated through the stomach tube, and vaccine therapy was very successful. In six patients who needed operative procedures, marked improvement was obtained, although a cure could not be expected. Four albuminurias and one severe nephritis of intestinal origin cleared up under vaccines.

Acid secretions in the oral cavity, urethra and vagina are frequent in these patients and improve under treatment for the toxemia. The urine is always acid.

OPERATIONS

In seventeen cases operation was an essential part of the treatment. There were eight "reconstructions of the colon," or removal of the ascending colon, with no mortality. Results were very satisfactory in five. In one case with a serious condition of adhesions from numerous former operations, fistula formed and secondary obstruction, all of which cleared up. In one patient with long-standing severe migraine and volvulus, the bowel condition was relieved, but the migraine returned and the diagnosis at the present time is still doubtful. In another patient, persistent headaches and vomiting were relieved by the end of a year and the patient is at business, but he has returns of his former trouble three or four times during the year. Here was a condition of apparent nephritis with high blood pressure relieved by removal of the colon. In only one of the eight operative cases, therefore, has the result been unsatisfactory.

There were four suspensions of the colon. The results were satisfactory except in one very advanced case in which a reconstruction of the colon should have been done. The patient is now lost sight of. Ileostomy was performed in one patient with a very severe, long-standing ulcerative colitis with delirium and semiconsciousness for two years. A preliminary course of colon vaccines for four months brought the patient into a condition for operation. The result was a wonderful mental change, which lasted for a year, death resulting from the ulcerative process, which was shown at necropsy to be very extensive throughout the pelvic region. The similarity in results from colonic vaccines and relief of toxemia by opening the ileum is remarkable.

Appendectomy as the only operation was done in three cases. In one carefully selected case the colon was not badly diseased, and the appendix alone, being considered enough of a cause, was removed, followed by a postoperative course in vaccines with great benefit. In another patient there was no choice of operation, as there was a large acute appendiceal abscess. An attempt to remove the appendix was unsuccessful; but there was a later recurrence of the abscess and the appendix was then removed. Colon vaccines were given faithfully between the operations and have been given since, and apparently they have helped to clear up the toxemia. Their actual value in this case has been classed as doubtful. The third appendectomy operation was performed outside of my control. It was a case of ulcerative colitis, and I had planned more extensive operation. The relief has been only temporary. Six months previous to operation the vaccines gave relief.

CONCLUSIONS

1. The predominating factor in the symptomatology of chronic intestinal toxemia is the colon bacillus.
2. In diseased conditions of the colon, the colon bacillus may become very harmful to the human organism by forming and liberating toxins, thus causing a toxemia.
3. This toxemia gives a definite symptomatology called chronic intestinal toxemia.
4. Putrefactive organisms often play an important part in intestinal toxemias, but the lasting effects are due to the colon bacillus.
5. In the study and treatment of all long-standing or severe chronic intestinal toxemias, autogenous colon vaccines should be administered in proper dosage.
6. Autogenous colon vaccines are helpful in the diagnosis of chronic intestinal toxemia.
7. The method of action of the colon bacillus vaccine is probably an immunization and sensitization of the body cells.

125 West Fifty-Eighth Street.

A NEW DEVELOPMENT IN SANATORIUM TREATMENT *

DANIEL E. DRAKE, M.D.
NEWFOUNDLAND, N. J.

In a multitude of cases the therapy of the ancients was as successful as that of today. The mute basreliefs on the walls of the health temple of Epidaurus portraying the recovery of individuals or of great groups of citizens are striking proof of the efficacy of ancient methods of cure. The Chaldeans, the Egyptians, the Greeks, the Arabs, peoples to whom we owe much of what we know in medicine as well as in astronomy; who devised the signs of the zodiac and mapped the heavens into constellations; who knew the divergence of the north star from true north; who invented the lever and the screw; who, fascinated with the power of higher mathematics, called it "al-gebra," the mighty; it is fair to suppose that such individuals really knew when they were cured and that their written records are at least as trustworthy as our own. When they recite that whole cities were relieved; that

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

arms, legs and heads were cured, that minds and bodies were restored; should we not accept it? If so, what is the conclusion other than that, with few and striking exceptions, cure was just as frequent and treatment just as effectual then as today?

If our ratio of cure is higher, as doubtless it is, what is the reason? Not better brains, surely, nor better facilities for treatment, but just one simple thing, *better diagnosis!*

Without more than touching on the results of this in terms of improved public health or in the decrease of infectious disease, let us consider what has been the course of events in the past decade as to the results of sanatorium treatment in the chronic lesions in which a high proportion of correct diagnosis should now be made. Preventive medicine and improved sanitation, controlled and fostered by organized cooperation, are the direct results of industrialized therapeusis based on diagnosis. Now this industrialization of medicine, which is a natural outcome of the spirit of the day, is further encouraged by the results obtainable in modern sanatoriums. These are comparable to mills, in that the raw human material enters, is sorted and ultimately grouped under separate diagnostic heads. Just as no single milkman can produce and peddle as wholesome milk as can a business corporation, so no single physician can produce a diagnosis and apply the therapy based on it as thoroughly as can a company of physicians working cooperatively with all the costly appurtenances necessary to diagnosis and therapy in the hands of specially trained workers.

It is therefore more necessary than ever that modern sanatoriums have a competent body of visiting consultants in addition to their own staff. As to the necessity of sanatoriums, no one has spoken more emphatically and convincingly than Stewart McGuire of Richmond: "The surgical operation never cures a patient, only puts him in the way to get well. It often takes months and even years for the patient to get back to his normal." From whatever viewpoint, from whatever angle, the image is the same; there is greater economic value to the restoration of a life impaired by the presence of a mechanical defect than in the improvement, greater or less, in so many syphilitics or arteriosclerotics. For the one, proper sanatorium treatment means the actual permanent removal of the cause and consequent return of normal efficiency; for the other, equally careful treatment means often health without work. It is as if the individual were thrown into a scale in the opposite pan of which lay work plus disability. What, then, is the true function of the modern sanatorium? Obviously, to remove from that scale the disability. For often in the past nothing more than the work has been removed, no systematic search having been made for the disability.

Analysis of seventy-five patients coming to Idylease Inn, all of whom complained of chronic constipation, congenital and acquired, showed that more than four fifths suffered from disorders of the alimentary canal, either reflex or organic. The remaining one fifth presenting troubles apparently quite remote from the abdomen, as neuralgias, myalgias, neuritides, nephritides, increased blood pressure, etc., were also finally proved to be suffering reflexly from a primary disturbance of the alimentary canal. A classification of the entire group shows it to be divisible into three types, as follows:

Type A, those suffering from a toxemia which will yield to the ordinary medical therapeusis, as devised by the ancients, namely, rest, diet, massage, hot-air treatment and hydrotherapy.

Type B, a very small, but seemingly distinct group, in which the toxemia is so pronounced that the treatment just mentioned gives only temporary and inconclusive results, but in which great benefit is derived from autogenous colonic vaccines. The degree of injury to the intestinal epithelium, referred to later, is probably the determining factor in this type.

Type C, a small but rapidly increasing group in which there is either congenital or acquired dysmorphia, tumor, injury or disease of the canal or associated viscera. Here are found the chronic appendix inflammations, gallstones, kidney stones, duodenal ulcers, occasional gastric ulcers, varices, bands, twists and other mechanical derangements.

Before discussing these types critically it will be well briefly to consider the question of what is meant by chronic autointoxication. It has been defined by Satterlee[1] as a "chronic diffuse toxemia of intestinal origin, the result of aberrant biochemical conditions, usually, but by no means always, bearing a measurable ratio to the delay in the onward passage of the intestinal contents as visualized by the Roentgen ray." There are two main theories as to the source of the poisons concerned in producing the well-known symptoms: first, that they are of bacterial origin; second, that they are derived from the cells of the intestinal epithelium itself. The former view originated with Metchnikoff and has been furthered by the researches of Combe and by the energetic writings and the work of Lane. The latter view is a product of the American and French schools of experimental surgery. Draper[2] in 1906 presented his conclusions before the Johns Hopkins Medical Society, based on a six-year research at his surgical research laboratory in Columbia University. This work was corroborated by Roger of Paris, working independently. It has taken fifteen years for this pioneer work to be accepted and applied clinically. It is evident, then, that this condition known as intestinal toxemia is usually dependent on a preexistent mechanical or functional intestinal obstruction. Obviously this cannot be complete, but the incomplete form undoubtedly causes symptoms analogous to the complete but less severe.

Draper[2] in 1906 showed that the poisons probably originated in the cells of the duodenojejunal epithelium, rather than from bacteria. Roger[3] in 1907 proved it probably to be a proteose, and Whipple[4] has recently confirmed this deduction by isolating what appears to be a proteose from the contents of loops of obstructed intestines. To the general student of this subject it is significant proof of the nonbacterial origin of the toxin that small doses injected from a loop, made by occluding both ends of a duodenojejunal segment for from forty-eight to sixty hours, will kill a dog in from thirty-six to forty-eight hours, whereas those from a similar loop in the colon or terminal ileum will not kill for more than a week. Yet what is the relative bacterial count? Every one knows that the duodenal area is nearly sterile, whereas the ileocolonic region is crowded with bacteria. The impor-

1. Satterlee: Chronic Intestinal Stasis, New York Med. Jour., June 12, 1915, ci, 1204.
2. Draper-Maury: Observations Upon a Form of Death Resulting from Certain Operations on the Duodenum and Jejunum, Surg., Gynec. and Obst., May, 1906, ii, 502.
3. Roger: Pathologie des intoxications, Paris, 1914.
4. Whipple: Proteose Intoxication (Later Studies), Jour. Exper. Med., Jan. 1, 1916, xxiii, 123. Proteose Intoxication, THE JOURNAL A. M. A., Aug. 7, 1915, p. 476.

tant studies on the duodenum and stomach by Barber[5] have here a direct bearing, as well as those of Sweet[6] and Frazier.

Evidently, as Lynch and Draper[7] find, the toxicity of the alimentary canal varies directly with its digestive activity; the stomach and colon, having no digestive power worth naming, are correspondingly lacking in toxicity. These authors aptly liken the stomach to a cement mixer. Indeed, the more carefully one studies gastro-intestinal cases and hears of "bilious attacks," the more convincing is the clinical evidence that the experimental viewpoint is right, namely, that the stomach and colon have no function save that of *storage* and *motility*. No fact in modern medicine deserves greater publicity than the seeming paradox that of every hundred "dyspeptics" only ten have any demonstrable lesion in the stomach itself.

In summarizing this résumé of laboratory studies in the obstructions we may conclude for clinical purposes that the toxin is derived primarily from aberrant cellular activity of the enteric epithelium due to interference with the normal intestinal flow; that the elimination of this toxin is chiefly done by the terminal colon; that this results in hyperemia, injury and lodgment of bacteria and other parasites; that often there follows a vicious cycle due to superimposition of toxins of bacterial origin. It is evident that the value of animal experimentation to applied medicine is incalculable.

Needless to say, no case should be put in Groups A or B except after the most exhaustive study, for it is fundamental that there must be a discoverable cause for every ailment. The writer's experience is uniformly at variance with the psycho-analytic hypothesis as to the etiology of disease. Every proof from the evolutionary doctrine, now universally accepted, reflects the human creature as a healthy animal, if born with an unimpaired body and accorded fair environment, and points inquiringly at those devotees of the cult who would base our shortcomings on decadences inherited from prehistoric simian ancestors of doubtful morality.

Illustrative of the ease with which chronic intestinal toxemia may cause symptoms referable to the mental state may be cited a few cases:

CASE 365.—Sk., an electrical engineer, aged 36, sent to Inn in 1905. Family history negative, had been well and strong until 22 years of age, when he had typhoid. He had overworked for fourteen years. He had suffered increasing constipation. He suddenly became exhausted mentally and physically, fell in street, suffered great mental anxiety, with increasing dread of being left alone. Tachycardia was present and persistent insomnia, all symptoms of toxemia. This patient came under Type A and was treated ten weeks. A permanent cure was effected in eleven weeks.

CASE 561.—Woman, aged 28, with a negative family history, was well and strong until 16 years of age, when she had pneumonia. Her menses were regular, but she was always constipated. Her chief complaint was intense worry and fear of impending trouble. She had a marked religious obsession and was constantly at prayer. She suffered from loss of weight and insomnia, and was unable to eat because of "stomach trouble." She was treated as is appropriate for type A, and was cured in twelve weeks, and has been well to date, after three years.

CASE 781.—A., a man, aged 60 years, with a negative family history other than one brother who had appendicitis and one sister who had had nervous prostration, had always been constipated and had had "bilious attacks" and "stomach trouble" after he was 10 years old. At 16 he had to give up school for two years, and suffered from depression, which alternated with exhilaration and religious fervor. At 18 he entered college, where he worked very hard and finally graduated, but, owing to conditions described he was able but partially to fill the position in life for which he was fitted, being constantly treated for "dyspepsia and liver trouble." An attack of depression beginning in 1907 lasted nearly four [illegible] months. The longest period of exhilaration was four months. I first saw the patient in April, 1914. He was then emaciated, irritable, very restless, sleeping only two or three hours at night. His systolic blood pressure was 190 mm. of mercury. His bowels were obstinately constipated. I classed him in Type A, and gave him treatment for six weeks. He greatly improved and remained normal until about the middle of November the same year, which exceeded any normal period for several previous years. Then followed a short period of depression, from which he quickly recovered under treatment. A Roentgen-ray study made at this time showed a large distended cecum and a distinct ptosis of the transverse colon. He returned for further treatment and after six weeks his bowels began to move normally. The blood pressure gradually dropped to 148 mm. of mercury, his weight increased 18 pounds, and to all appearances he is now normal. While it does not seem fair to call this a complete cure, it does show the benefits of Group A treatment over persistent use of medicines in cases of this nature.

Returning now to a further analysis of the three groups into which Idylease Inn patients have been grouped, I would say that in Group A the intestinal toxemia is probably due directly to inattention to regular evacuation; to the mechanical neuromuscular and vascular injury of the intestine wall by the masses of hard feces; to a flaccid abdominal wall; to a toxic interference with the normal secretions of the intestine, notably the mucoid; indirectly to the habits and customs; the pressures of modern life. It takes from two weeks to three months to cure these people. That not all of them would be cured by ordinary rest and medical treatment in double this time is instanced by the history of the following:

CASE 482.—S—y, woman aged 25, stenographer, with a negative family history, complained chiefly of "stomach trouble"; she had been treated for "dyspepsia" for one year. As there was a recurrence of the symptoms, she came to Inn at expiration of this period, in May, 1909. There were marked symptoms of hysteria and mental depression. Group A treatment was given and in eight weeks the woman gained 17 pounds. A permanent cure was accomplished.

Group B embraces those cases in which there is probably a mild mechanical basis for the development of the toxins, but one not definitely susceptible to Roentgen ray or other proof, or possibly a subinfection of the type described by Adami. The subjects of this group tend to relapse very persistently after resuming the workaday load. Whatever may be the explanation, it is clinically certain that not a few are greatly benefited by autogenous colonic vaccines, if these are skilfully prepared. Hektoen,[8] speaking of the action of autogenous vaccines, says:

"In subacute and chronic localized infections, the results appear to indicate that specific vaccines properly and skilfully used have value, quite likely, because they increase the production of specific antibodies, as demanded by the theory, but probably also because they stimulate leukocytic and other activities."

5. Barber: Dilatation of Duodenum, Ann. Surg., 1915, lxii, 433; Dilatation of Stomach, Med. Rec., New York, May, 1915, lxxxvii, 718.
6. Sweet: High Intestinal Stasis, Ann. Surg., June, 1916, lxiii, 720.
7. Lynch and Draper: The Protective or Esoteric Symptoms of the Alimentary Canal, Virginia Med. Semi-Month., March, 1916, xx, 601. Frazier: Experimental Colonic Stasis, Ann. Surg., June, 1916, lxiii, 729.
8. Hektoen: THE JOURNAL A. M. A., May 20, 1916, p. 1591.

Illustrative of this group are the following histories:

Case 1002.—S—s, a woman aged 32, had chronic constipation caused by the mechanical pressure of a fibroid uterus. There was good postoperative recovery from hysterectomy, but the functional improvement was slow, although hydrotherapy and massage were used freely. There was immediate and continued improvement under regular injections of colonic vaccines.

Case 660.—W—b, a woman, aged 28, with a negative family history, as a child had had measles and whooping cough severely. She had always been constipated, and cathartics were continually necessary to move the bowels. She had always had sick headaches, and in recent years these were accompanied by vomiting. Her last illness was brought on by shock and grief two years before. Her chief complaint was tension in back of the neck and down the spine, with a sensation of the head being drawn downward. There was marked depression, insomnia, and emaciation; she had a tired, anxious expression, and the skin was dry and sallow. The tongue was coated and the breath was foul. There was no thyroid enlargement, and the heart and lungs were normal. The abdomen was slightly distended by gas. The cecum was enlarged and, with the transverse colon, was tender under pressure. Under Group A treatment improvement was very slow until colonic vaccines were added and the patient then made a remarkably rapid recovery. Treatment was continued one year.

Case 980.—R—c, a woman, aged 34, with a negative family history, as a child had been very nervous and always constipated. She menstruated at 14 and suffered severe pain. She had an operation at 20 for appendicitis. She was married and had two children. For the past ten years the patient had been a complete wreck. She had been treated for hysteria, gastric ulcer and excruciating pain in the lower left quadrant of the abdomen. She had threatened suicide unless some relief was given her. I first saw the patient in January, 1915, when she was extremely nervous, unable to sleep, had no appetite, was very hysterical, and had lost several pounds in weight. On examination I found the uterus was retroverted and the left ovary tightly bound down with adhesions. A Roentgen-ray study showed the stomach to be normal, but there was a kinking of the duodenum from adhesions, a band of adhesions involving the terminal ileum, and adhesions about the transverse colon. Operation was performed in December, 1915, and the adhesions were broken up; the uterus was suspended and left ovary liberated. After operation hydrotherapy, massage and vaccines were continued; at the expiration of three weeks the bowels acted normally. She has gained in weight 30 pounds and is entirely free from former symptoms.

Group C comprises the most interesting class of cases, and shows what can be done by preventive and physiologic surgery. Further, it demonstrates the importance of the stomach as an organ which reflects disease in other organs; the "protective or esoteric symptomatology" and the danger of misunderstanding this most salient characteristic. What a salutory change has come over our crude conceptions of five years ago, when we were treating "hypochlorhydria" and "hyperchlorhydria," for example, as clinical entities instead of utilizing these reflex symptoms to diagnose the fundamental lesion. Until recently we certainly have failed to interpret the lesson which the stomach has had to give.

Case 1202.—T—r was treated for years by some of the best gastro-enterologists in the country for "dyspepsia" and "stomach trouble," based on analysis of stomach contents. After diagnosis, a large gallstone and a chronic adherent appendix were found to be the mechanical cause of the gastric inhibition. Both were removed, and cure was accomplished after prolonged hydrotherapy.

Case 1232.—M. J., bank clerk, aged 21, had eight years' treatment by a prominent internist for "dyspepsia" and "bilious attacks." Many gastric analyses were made. A typical history of kidney stone was proved by the Roentgen ray. There was a gain of 20 pounds in weight in the two months following operation, because the stomach was no longer reflexly inhibited.

By far the most interesting, however, is a subgroup of Type C, which has been made of those patients requiring the operation well called "developmental reconstruction" of the colon. This operation, as its designation implies, consists in the removal en masse of the terminal ileum, appendix and cecocolon as far beyond the hepatic flexure as the right colic artery. It was done in ten cases. It was practiced on patients suffering from a great variety of lesions, and on whom every form of medication had been essayed without result. Not the least conspicuous in the symptomatology of this group was mental incoordination, progressive deficiency and in some cases suicidal mania. The technical studies, the indications and the sequelae following this type of operation have been given in detail by Bloodgood, Lynch and Draper,[9] Mayo,[10] Martin and others.[11] It is here opportune to cite that in my experience speed of recovery from the toxemia has been directly proportional to the extent of preoperative and postoperative hydrotherapeutic treatment, with, in many cases, the diligent use of autogenous colonic vaccine; for it is in this group that one finds the skin lesions due to toxemia most marked.

It is of great therapeutic interest to note that in each of our patients requiring this operation there was found marked congenital dysmorphia of the cecocolon, which consisted of a long common mesentery to the cecum and terminal ileum; a diseased and usually misplaced appendix, and Lynch's "elbow deformity" of the colon at the hepatic flexure, where dense adventitious bands bound it down, with partial obliteration of the lumen. A high percentage of these patients had suffered from bloody diarrhea, and microscopic examination of the excised intestine showed its origin to have been at the point of these adhesions.

Summarizing these data, it is clear that the new element in sanatorium treatment is based on diagnosis and on a recognition of physiologic truths as opposed to old medical beliefs.

Clinically, as well as experimentally, the stomach is not a digestive organ any more than is the colon, but, like it, a storehouse; the one rhythmically supplies the churned food to the small intestine, in which all digestion takes place; the other at intervals removes the ash.

The symptoms of intestinal toxemia are protean. They are caused by the absorption of a substance, perhaps a proteose, which takes origin primarily in the epithelium in the small intestine itself and secondarily from bacteria. The symptoms are rarely in evidence unless there is chronic constipation or disease somewhere in the abdomen. Toxins are eliminated chiefly by the terminal colon. This is an argument against the removal of the entire colon and in favor of frequent irrigation.

9. Lynch and Draper: Developmental Reconstruction of Colon Based on Surgical Physiology, Ann. Surg., February, 1915, lxi, 166. The Infected Colon and Its Surgery, Med. Rec., New York, June 12, 1915, lxxxvii, 983; Contribution to the Surgical Physiology of the Colon, Ann. Surg., 1915, lxii, 441; Anastalasis and the Surgical Therapy of the Colon, Am. Jour. Med. Sc., December, 1914, cxlviii, 828; The Surgical Treatment of Intestinal Toxemia, New York State Jour. Med., 1916, xvi, 362.

10. Mayo: W. J.: Resection of the First Portion of the Large Intestine and the Resulting Effect on Its Function, The Journal A. M. A., Aug. 8, 1914, p. 446.

11. McGlannan, A.: Intestinal Obstruction, The Journal A. M. A., Aug. 21, 1915, p. 673. Snow, I. M.: Intestinal Obstruction, New York State Jour. Med., 1916, xvi, 359. Bloodgood, J. C.: Dilatation of the Duodenum, The Journal A. M. A., July 13, 1912, p. 117.

Not being a surgeon, but a physician, interested in the future rather than in the past, and having had more than a decade of experience in sanatorium development and management, I regard these rapid changes in our knowledge of very great importance. In many ways our nimble American public leads our profession, and people are crowding to the sanatoriums in the expectation of getting what too often cannot as yet be given them, because of lack of preparation and equipment. The ancients equaled us in treatment; in diagnosis only do we surpass them. Let us all be prepared to make that diagnosis.

CONCLUSIONS

1. Diagnosis is the all-important factor in sanatorium administration. Sanatoriums, in addition to equipment, require a competent body of visiting consultants.

2. The relative values of diagnostic findings in order of importance are as follows: 1, history; 2, Roentgen ray; 3, physical examination. Chemical examination of the stomach contents is of little or no diagnostic value.

3. The cause of "dyspepsia" is found in the stomach itself in but 10 per cent. of all cases.

4. Constipation in seventy-five cases dated from the seventeenth to the sixty-eighth year. The group to which a patient belonged was determined by the cause underlying the constipation.

5. Intestinal toxemia is a vague definition of a definite clinical entity. It is caused primarily by toxins from the cells of the epithelium of the intestine itself; secondarily by bacteria.

6. There are three distinct types into which intestinal toxemics may be grouped, dependent probably on the degree of permanent injury done the mucous membrane of the cecocolon and on the presence or absence of mechanical intra-abdominal abnormalities.

7. Autogenous vaccine therapy is often useful as a diagnostic aid and may give brilliant results in chosen cases.

8. The group requiring surgical therapeusis, in addition to the usual sanatorium care, is rapidly growing in size and importance.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SATTERLEE AND DRAKE

DR. E. S. BISHOP, New York: What Dr. Drake has emphasized and that which I feel is most important is the adequate environment and restful care and diagnostic care received in the sanatorium.

DR. FENTON B. TURCK, New York: The so-called intoxications due to colonic stasis have not given up the secret of the toxin, its nature or manner of elaboration. Certain foods give anaphylactic symptoms; hence, acute symptoms of intoxication may be induced by ingestion of alien proteins, apparently independent of the concentration or virulence of intestinal flora. Many conditions of chronic alimentary toxemia are favorably influenced by diet, exercise and cleansing of the bowel without specific bacterial therapy. No evidence has been brought forward that cultures of the aerobic colon group of intestinal bacteria evolve a true toxin. At the same time, we must recognize the probability of at least a contributory rôle of bacteria in the formation of split proteins. My personal experience convinces me that selected cases show a specific and remarkably favorable reaction to vaccine therapy.

My cultures were made from feces high in the bowel to insure activity of the flora, cultured in bouillon, killed at 57 C., sensitized against the serum of the patient and injected subcutaneously in doses of from 50,000,000 to 100,000,000. In building up the systemic immunity by vaccines we are not combating a true infection. The bacteria, under favorable conditions, permeate between the cells of the mucosa and penetrate the submucous tissue of the intestinal wall, where they rapidly undergo lysis, apparently from the action of antibodies in the tissue. Under such conditions experimental animals show typical anaphylaxis. In this research, factors favoring bacterial migration from the lumen were found to be chronic stasis with splanchnic stagnation and acute shock. Less favorable were starvation, violent catharsis and slowing of peristalsis by morphin. In the majority of cases, it would seem rational to attack directly the stasis and thus cut short exposure to bacterial immigration, whether or not autogenous vaccines are administered. Two conditions that can be demonstrated definitely as requiring correction are the atony of the muscle wall and the stagnation of blood in the veins of the splanchnic area. The indications are for treatment of the colon by irrigation with water at a temperature of 125 F., which at once corrects the venous congestion, relieves spasm and stimulates formation of protective antibodies in the wall of the gut. Cold water may be alternated with the hot to improve vascular tone; and the muscle walls may be influenced directly by rhythmic alternation of tension by vibrations of a column of air introduced through the colonic tube by a Politzer bag. With postural exercise and hydrotherapy the diet should be controlled to give a minimum of protein residue and a minimum amount of meat extractives; bulk is afforded the bowel by bran, Irish moss and agar-agar. Besides the laxative influence, liquid petrolatum, as well as kaolin, seems to inhibit the migration of intestinal bacteria to a considerable degree.

DR. G. R. SATTERLEE, New York: These discussions remind me of the definition of the gastro-enterologist as one who disagrees in treatment with everybody else. Each one may have a different method and yet obtain the same results. I do not wish to claim that the autogenous colon vaccines are the only form of treatment for chronic intestinal toxemia, but that they are extremely valuable in the study and treatment of these cases. Dr. Turck spoke of the flora of the gastro-intestinal tract. I have made no long series of studies on the flora in these cases, as I do not believe that the intestinal flora has much to do with the toxemia. Dr. Turck did not speak of the injuries to the mucosa and ulcerations that are found in the colon. These are frequent and may account for the adhesions covering the colon in these toxic cases and caused probably by the altered colon bacilli. Dr. Turck spoke of the venous congestion of the bowel wall. All of the toxic colons which have been seen at operation show marked venous congestion and many of them marked adhesions. Except in severe cases of intestinal toxemia, I do not believe that the *Bacillus coli* is found frequently in the upper gastro-intestinal tract. I have been taking cultures from the stomach in my cases and this bacillus is an exception. To obtain active organisms, it is my custom to give a cathartic and wash out the colon, in order to get cultures from the upper bowel, where the trouble lies in about 90 per cent. of the cases. Bacteria obtained from the cecum will give a strong reaction and good results. The attenuated bacteria may give poor results or fail. Improper diet can cause fermentation and proper diet the reverse; it is also possible to get rid of the fermentation, in certain cases by autogenous colon vaccines, without change in diet.

The Fascination of Notoriety.—It has been my experience, sir, that the normal person enjoys seeing his or her name in print, irrespective of what is said about them. I have an aunt, sir, who a few years ago was a martyr to swollen limbs. She tried Walkinshaw's Supreme Ointment and obtained considerable relief—so much so that she sent them an unsolicited testimonial. Her pride at seeing her photograph in the daily papers in connection with descriptions of her lower limbs before taking, which were nothing less than revolting, was so intense that it led me to believe that publicity, of whatever sort, is what nearly everybody desires. Moreover, if you have ever studied psychology, sir, you will know that respectable old gentlemen are by no means averse to having it advertised that they were extremely wild in their youth.—P. G. Wodehouse, *Saturday Evening Post.*

INSTITUTIONAL TYPHOID EPIDEMIC COMBATED BY VACCINATION *

PHILIP B. NEWCOMB, M.D.
MOUNT PLEASANT, IOWA

That typhoid fever is practically endemic in many state hospitals for the insane is a fact hardly to be controverted. That it is occasionally epidemic is also a matter of public record, and of late has been well illustrated in the acute outbreaks of this disease at the institutions at Danville, Pa., and Osawatomie, Kan. Likewise it is true that the source of the infection is often difficult to discover and more frequently is never ascertained with any degree of certainty.

The success of typhoid vaccination in the military organizations of the world has caused similar attempts at immunization to be made from time to time by different state institutions. But in many instances these efforts have been sporadic, and the literature of the subject in this country, exclusive of the army reports, is meager in the extreme. The earliest record of typhoid vaccination en masse in institutions is that of Hachtel and Stoner[1] in 1912. They report 2,000 cases. Recent reports are those of Burlingame[2] of 2,000 cases and Weston[3] of 3,500 cases. The latter covers a period of four years, from 1912 to 1916.

In the spring of 1916, the complete and compulsory immunization of 1,498 individuals comprising officers, employees and their familes and patients of the state hospital, Osawatomie, Kan., was employed to stop an acute outbreak of typhoid fever. The circumstances encountered and procedures inaugurated differ from previous reports in some particulars, and the main points of divergence seem worthy of mention.

The majority of recorded inoculations were made with some degree of leisure, usually by the routine method over a long period of time, and rarely as a protective measure in the face of imminent danger. The series of inoculations here reported was carried out in the midst of an acute epidemic and for the express purpose of stopping that epidemic as soon as possible.

During the late summer of 1915, the town of Osawatomie, situated 1 mile from the hospital, suffered an epidemic of typhoid fever comprising twenty-five cases. At this time no cases appeared in the hospital. During November and December of the same year, four typical cases developed in the institution. In addition to these were several atypical cases, and one of these patients, F. J., to be mentioned later, was confined to his bed but a few days. His was the first suspicious case seen at the hospital.

In January and February, 1916, other suggestive cases of illness occurred which conformed neither to the ordinary conception of influenza, which was then rampant over that section of the country, nor to typical typhoid fever, and no positive Widal reactions were obtained. At this time, however, the patient F. J. gave a positive Widal. The feces and urine were examined and no typhoid bacilli found in any case.

From early autumn I had urged the advisability of immunizing the attendants and patients, but the procedure was unfortunately not inaugurated until an epidemic had manifested itself. The disease can be said to have been endemic in the hospital from November until March, when an epidemic occurred, the latter consisting of forty-one well defined cases.

During the latter part of March, a number of the officers and employees voluntarily subjected themselves to typhoid vaccination. April 5, twenty-one persons had been stricken, among whom was the superintendent of the institution. There was imminent danger of a very extensive and disastrous spread of the infection. Authority was obtained from the board of control to enforce general immunization on officers, employees, families resident on the grounds and patients alike. Very few objections were raised to this arbitrary order, and no refusals, resignations or dismissals occurred in consequence. Inoculation was begun the day after the order was issued. The bacterin used at this time was the ordinary serial package from a reliable pharmaceutical house. It was foreseen that the amount of bacterin which would be required for complete immunization for the entire hospital population, if furnished at the market price, would be almost prohibitive. A quantity of bulk bacterin was therefore prepared from the same strain of bacillus as that used by the army. The suspension was made so that 0.5 c.c. contained one-half or one billion bacilli as required for the initial and two subsequent doses. About 150 doses of the commercial bacterin were given, and the remaining 4,378 doses were from the bulk laboratory preparation. Much the same technic was used as that described by Weston,[4] although differing in some minor points. All inoculations were made at night. Patients of the better class and those of a chronic demented type were ranged in line on their ward corridors. This arrangement saved much time, and was far more convenient than going from room to room. Nurses had the patients' arms bared, and the assistant, preceding the physician, applied iodin at the insertion of the deltoid. With resistive patients and those in seclusion, the application of iodin and the subsequent injection were made at the most accessible part, usually the leg or thigh. No abscesses followed the injections. The average time required for inoculation was twelve seconds per subject among the acute and eight seconds among the chronic patients.

No severe reactions were noted, although a few patients experienced mild chills. Agglutination tests following immunization have not been made.

Every effort was made to locate the source of the infection. Carriers were looked for, but none found. The food supply came from ten different sources. The water supply for all buildings was the same, a drilled well, 165 feet deep. Water from this well was held in high repute in the hospital community because repeated analyses failed to show any contamination. Suspicion was directed toward this well because of its proximity to an unlined reservoir which was supplied from the Marais des Cygnes River, a stream which overflows its banks with every heavy rain and which is little less than a drainage ditch for several counties. This reservoir was about 100 feet from the well. The water in it was used for washing. Water from the well was drunk by the officers and patients, but it was impossible to prevent some of the patients from drinking the reservoir water direct from the taps in the toilet rooms. Among

* From the records of the State Hospital, Osawatomie, Kan.

1. Hachtel, F. W., and Stoner, H. W.: Inoculation Against Typhoid, THE JOURNAL A. M. A., Oct. 12, 1912, p. 1364.
2. Burlingame, C. C.: Journal-Lancet, 1915, XXXV, 165.
3. Weston, P. G.: Typhoid Vaccination, THE JOURNAL A. M. A., April 8, 1916, p. 1089.
4. Weston, P. G.: The Immunization Against Typhoid of Eight Hundred and Ninety-Eight Patients in an Institution, THE JOURNAL A. M. A., Oct. 26, 1912, p. 1536.

the latter there was practically no typhoid fever. It was necessary to direct attention in another direction. It was found that a kitchen drain from Cottage B ran within about 15 feet of the well. On suspicion the well was accordingly closed, April 10, the day on which the location of the drain was found. Thereafter all water used in the hospital was boiled river water.

Exhumation showed the drain to be an open-joint earthen pipe laid many years ago, and honeycombed with leaks. The drain was crossed above by a sewer of poor construction which also drained a portion of Cottage B. Near the intersection was found an area of seepage from the sewer above to the kitchen drain beneath at a point where it ran nearest the well and toward it. No area of seepage was found from the reservoir mentioned above and the well. It is interesting to note that the employee F. J., the first suspicious case to appear at the hospital, was cook at Cottage B., where he resided. He had visited the town of Osawatomie frequently during the time that typhoid fever was epidemic there. The patient D. F., who was the first case in the acute outbreak at the hospital, was an inmate of Cottage B. Examination of the well water showed the presence of *Bacillus coli*. No typhoid bacilli were found.

COMMENT

The most preferable way of dealing with institutional typhoid epidemics is to prevent their occurrence by means of a general immunization whenever typhoid is in the vicinity, or on the advent of the first suspicious resident case.

Routine inoculation of new patients and recently installed employees at stated intervals would conduce toward safety, and should be made the rule in any institution with a large resident population. This routine inoculation with bacterins can be made compulsory without serious objection on the part of patients or employees, and can be carried out speedily, effectively and with perfect safety.

It is impossible to determine absolutely whether the checking of the epidemic mentioned was entirely due to the use of typhoid vaccine or to the closure of the suspected well. From the recorded experience of others in the use of typical vaccines, and from the facts here reported, however, one is inclined to believe that the vaccine played at least a very important part in the control of the epidemic.

In any epidemic, all sources of food and water supply should be under suspicion and examined most carefully, no matter what their previous reputation may have been.

The Normal.—When we look broadly at biological phenomena, it is evident that they are distinguished by one universal characteristic. The structure, activity and life history of an organism tend unmistakably to maintain a normal. Accident may destroy an organism, or even a whole species, but within limits of external environment, which are the wider the more highly developed the organism is, the normal life history of each individual is fulfilled.—J. S. Haldane: "The New Physiology," *Science*, Nov. 3, 1916.

STREPTOCOCCUS INFECTION AS A CAUSE OF SPONTANEOUS ABORTION*

ARTHUR H. CURTIS, M.D.
CHICAGO

The belief that infection is a cause of recurrent spontaneous abortion and stillbirth is not original; in fact, the theory that it is the essential factor in many instances of "idiopathic" fetal death has a considerable number of adherents.

Study of the *Spirochaeta pallida* has already demonstrated one infectious organism which is directly responsible for death of the fetus in the later months. That other varieties of bacteria should likewise possess the power of interrupting the course of pregnancy is to be anticipated. Conclusive evidence that such infections occur, demonstration of the characteristics peculiar to the invading organisms, and discovery of the foci from which reinfection develops in subsequent pregnancies, should do much to stamp out hitherto inexplicable cases of stillbirth. The object of the present report is to produce evidence which is helpful in the solution of this problem.

In the study of scurvy in guinea-pigs, streptococcus infection of the placenta was observed by Jackson and Moody. This reawakened interest in the old question of infection of the offspring through the placenta, and for the past year we have attempted to secure material for bacteriologic study from patients with spontaneous nonsyphilitic stillbirths. Such material is difficult to obtain; aside from some abortion cases in which criminal interference was evidently the source of infection, only the two cases herewith discussed have thus far been available.

Fig. 1.—Streptococci in catheterized specimen of urine from patient with spontaneous stillbirth; Gram stain.

REPORT OF EXPERIMENTS

CASE 1.—A patient, whose tonsils had previously been removed because of yearly recurrent tonsillitis, developed pyuria late in pregnancy and gave birth to an ill nourished child which died within twelve hours. Late in the following pregnancy, which occurred two years thereafter, pus again suddenly appeared in the urine. There was associated aching and a feeling of fulness in the region of the right kidney. A few days later, after spontaneous labor, a well formed stillborn child was delivered. The patient passed through an uneventful puerperium and was afebrile when I first saw her, two weeks subsequent to delivery.

Despite the mild nature of the vesical symptoms, catheterization was performed to determine the character and extent of the infection. Scattered pus cells and numerous cocci in pairs and chains (Fig. 1) were found in every field. In culture, hundreds of colonies of hemolytic streptococci developed.

This streptococcus produces hemolysis and grows freely in plate cultures. The microscope reveals a strongly grampositive coccus, characteristically of rounded form, and of good size. Always in pairs, it often forms small clumps; on broth, and in condensation fluid, chains of considerable length occur. Litmus inulin is not acidified.

Injection of the patient with a small dose of autogenous vaccine (10 millions) was followed by a recurrence of lumbar

* From the Pathological Laboratory and Gynecological Service of St. Luke's Hospital.

aching and fulness, this time bilateral and most pronounced in the region of the left kidney.

A rabbit in the earliest palpable stage of pregnancy (from eight to twelve days) was intravenously injected with 2.5 c.c. of a washed ascites-broth culture. After an apparently normal course for six days, this animal was subjected to necropsy. Over 100 c.c. of clear fluid, such as Dick and I[1] found almost

Fig. 2.—Bicornate uterus of a pregnant rabbit, containing fetuses undergoing absorption. Embryos less than one-half the size attained at time of intravenous injection, one week previously.

pathognomonic of early pregnancy in rabbits, were present in the abdominal cavity.

The uterine vessels were enormously distended. Two nodules were found in the right uterine horn, and at least two less distinct ones were present in the left horn. To Dr. Jackson, Dr. Moody and myself, the evidence was convincing that absorption of fetuses had occurred. The other viscera revealed no changes. Mediums inoculated with the ascites fluid remained sterile; from the heart's blood were obtained a few colonies of streptococci; from the kidney innumerable colonies of streptococci developed. Smears from the uterine cavity contained moderate numbers of the same organism. Histologic study of the uterus and other viscera will be subsequently reported by Dr. Jackson.

A rabbit two and a half weeks pregnant was intravenously injected with 2.5 c.c. of a washed ascites-broth culture of the streptococcus. The fetuses dwindled, in a period of seven days, from nodules the size of the rabbit's kidney to masses less than one-half as large (Fig. 2). Necropsy revealed that these numerous embryos were undergoing absorption (Fig. 3).

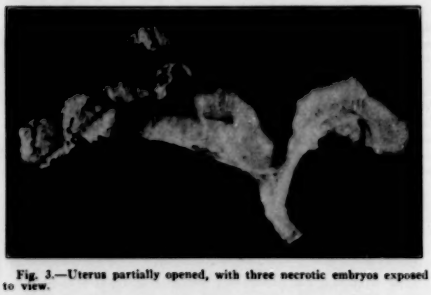


Fig. 3.—Uterus partially opened, with three necrotic embryos exposed to view.

Minute kidney abscesses, arthritis of the left knee joint, and an early lobar pneumonia were also present.

Fresh preparations and cultures from the uterine cavity and from the kidneys yielded the streptococcus in pure growth. Mediums inoculated with free peritoneal fluid remained sterile.

CASE 2.—A patient of Dr. B. A. McBurney and Dr. De Lee, whose case was reported recently,[2] with history of a previous pregnancy with infection, gave birth to a stillborn fetus. At necropsy Moody found a streptococcus which he obtained in pure culture from the placenta and from the heart's blood. A subculture of this organism was used by me for further study.

Growth did not readily occur on plates, and hemolysis was not obtained on blood-agar slants. In other respects this organism is the counterpart of the streptococcus described in the preceding experiments.

A pregnant rabbit, near term, intravenously injected with 3 c.c. of a twenty-four hour washed ascites-broth culture of this streptococcus, gave birth to nine young on the following day. Of this litter four were dead and the five small remaining premature (?) young died within a few hours. The mother rabbit maintained the appearance of good health.

A month later, when two weeks pregnant, this rabbit was again intravenously injected with 3 c.c. of a twenty-four hour washed ascites-broth culture. After five days this apparently healthy rabbit was killed. In the uterus were found half a dozen retrogressing fetuses in varying stages of absorption. Smears from the uterus (Fig. 4) contained the streptococcus, which grew in pure culture in inoculated mediums.

Fig. 4.—Streptococci in smears from the uterus of a rabbit containing fetuses undergoing absorption; Gram stain.

Another rabbit, slightly more than two weeks pregnant, was injected with 2 c.c. of a twenty-four hour washed ascites-broth culture. Five days later, palpation revealed evident retrogression of pregnancy. The rabbit seemed in good health, but was killed. At necropsy the uterus contained seven dead fetuses undergoing absorption. Smears from the lining of the uterus contained large numbers of the streptococcus. In cultures a pure streptococcus growth was obtained. These pathologic specimens were preserved for study.

COMMENT

From the urine of a patient who gave spontaneous birth to a stillborn child were obtained large numbers of streptococci. Two pregnant rabbits were intravenously inoculated with cultures of this organism. Death of the fetuses followed. One mother appeared to be in normal health, the other became seriously sick some days after the death of the fetuses. Pure cultures of the streptococcus were obtained from the kidneys and from the uterine contents of both animals.

From a spontaneous stillbirth were obtained pure cultures of a gram-positive streptococcus. A series of three pregnant rabbits was intravenously injected with washed cultures of this organism. In each instance

1. Dick, G. F., and Curtis, A. H.: Previously unpublished incidental findings in a study "Concerning the Function of the Corpus Luteum and Some Allied Problems," Surg., Gynec. and Obst., November, 1912, p. 588.

2. De Lee, J. B.: A Bacteriologic Study of the Causes of Some Stillbirths, THE JOURNAL A. M. A., July 29, 1916, p. 345.

there was premature labor or death of the embryos with absorption. Serious maternal illness was not evident. At necropsy, pure cultures of the streptococcus were recovered from the uterine cavity.

Whether organisms other than the streptococcus possess the power of interrupting the course of pregnancy does not materially influence these results. These facts remain: Streptococci can be isolated from women who give spontaneous birth to stillborn children; streptococci have been obtained in pure culture from the placenta and from the stillborn fetus; intravenous injection of pregnant rabbits with cultures of these streptococci is followed by fetal death; the streptococcus can be isolated in pure culture from the fetus and from the uterine cavity of the mother rabbit.

The streptococcus encounted in these cases appears to be peculiarly adapted to infection of the genitourinary tract. Several closely related, probably identical strains, have been isolated from patients with uterine, tubal and kidney infections. Possessed of certain variability in cultural characteristics, these strains have much in common. We may have here to do with a type of streptococcus especially modified by, and with especial affinity for, growth in the genitourinary tract; it is characterized by persistence of infection, low virulence, and richness of growth on artificial mediums.

SUMMARY

From the urine of a mother whose child was born dead, also from the placenta and heart's blood of a stillborn child, smears and cultures yielded large numbers of streptococci. Intravenous inoculation of pregnant rabbits was followed, in every instance, by abortion or absorption of the fetuses with recovery of the streptococcus in pure culture from the maternal uterus.

106 South Michigan Avenue.

THE TREATMENT OF CERTAIN DISEASES OF THE SKIN

BY THE INTRAVENOUS INJECTION OF A FOREIGN PROTEIN *

M. F. ENGMAN, M.D.
AND
R. A. McGARRY, M.D.
ST. LOUIS

It is, no doubt, a common experience to observe beneficial effects in certain chronic conditions from intercurrent infections associated with high temperature. This we have observed in connection with certain diseases of the skin. One has seen the nodules of leprosy rapidly disappear after an intercurrent infection associated with high temperature: the bite of a cobra, as is well known, frequently causes a rapid resolution of the cutaneous lesions in this disease. One has seen psoriasis disappear during an intercurrent pneumonia, or typhoid; also the lesions of mycosis fungoids, after an intercurrent infection; we have artificially produced this in two cases by the injection of Coley's fluid (probably owing to the foreign protein). In one of them, the disintegration was so rapid that we fear it caused an earlier dissolution of the patient than would otherwise have occurred. A similar retrogression of lesions during hyperpyrexia has been observed in syphilis, and tuberculin has been known to affect the efflorescence on the skin after a "test" injection.

Some years ago one of us suggested to a well known leprologist the injections of typhoid vaccine for the treatment of nodular leprosy, founded on the foregoing observed facts, with the thought that probably it was the hyperpyrexia which caused the resolution of the lesions, namely, that it was probable that the lepra bacilli did not thrive at a high temperature and that during a period of hyperpyrexia, though artificially

Fig. 1 (Case 1).—Condition of patient with psoriasis on admission.

produced, the organisms were killed, with subsequent involution of the lesions.

The artificial production of high temperature as an experimental method of treatment for various diseases of the skin has occurred to us several times in the course of years, but our thoughts on this subject were crystallized on reading an article by Jobling and Petersen[1] in which they review the subject of specific therapy in its relation to the production of certain changes in disease. They particularly refer to the "common clinical experience that some diseases, among them subacute joint diseases, neuralgia, diabetes, pernicious anemia, certain dermatoses, sarcoma, etc.," seem to receive distinct beneficial results following intercurrent febrile conditions, and they ask the question, Is it possible that these varied agents influence the course of disease by the production of high temperature?

From their investigations made at former times, they come to the conclusion that it seems probable that the remedial effects apparently produced under such conditions are due to "colloidal dispersion, in that the injections probably bring about a less dispersed state, affecting not only the serum proteins but also the serum lipoids." They go on to say:

> Such an alteration is sufficient to account for the fluctuations in the ferment-antiferment balance and in the coagula-

Fig. 2. (Case 1).—Condition after injection; deep pigmentation only.

tion mechanism, as well as in the opsonic and complement powers of the serum, although it does not at present explain the increased antibody titer. . . . With this as a basis we can understand that so many and diverse substances can bring about a reaction almost identical clinically and therapeutically.

In other words, Jobling and Petersen believe that the beneficial effects produced in typhoid and in other

* Preliminary Report from the Barnard Free Skin and Cancer Hospital.

1. Jobling, J. W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

diseases by the injection or accidental introduction of foreign proteins are due to the mobilization of ferments, as "in experimental animals the intravenous injection of bacteria, kaolin, protein-split products and trypsin is almost invariably followed by more or less marked mobilization of serum protease and usually of lipase." They state that in the patient a similar reaction occurs following the intravenous injection of vaccines and proteoses, but not to the same degree or

Fig. 3 (Case 3).—Condition of patient with lupus erythematosus before injection.

with the same regularity as in animals. Every one interested in therapy, not only of skin diseases, but also in other branches of medicine, should read and meditate on this most important and suggestive work of Jobling and Petersen.

An article by Miller and Lusk,[2] an echo of the one by Jobling and Petersen, appeared in the same issue of THE JOURNAL. Miller and Lusk report the startling influence on typhoid fever by the injection of the proteose as prepared by Jobling and Petersen, and state that they obtained the same result with this agent in the abortion of typhoid fever as they did with the intravenous injections of typhoid vaccines. Their results were simply confirmatory of those already recorded by other observers, but they believe that the apparent sudden termination of the disease was probably not due to the specific action of the typhoid vaccine, as proved by these investigations, but to the introduction of a foreign protein. They, therefore, decided to apply the method to acute, subacute and chronic arthritis. The results in these conditions were equally startling and satisfactory.

An article by Louis D. Smith,[3] in the same issue of THE JOURNAL, on the value of anaphylaxis in the treatment of gonorrheal complications and gonorrheal rheumatism, was in the same train of thought as the two articles mentioned above. Smith, in his investigations, used horse serum in gonorrheal patients, feeling that the virtue of the antigonococcus serum in these conditions was due not to its specific effect, but to the anaphylaxis produced in the patient by the horse serum. His results were equally clinically striking and beneficial, owing, no doubt, to the introduction of a foreign protein and not to the anaphylaxis.

With the road thus boldly outlined by these investigators, together with our former thoughts along the same lines, we were encouraged to experiment with some foreign protein in the treatment of various skin diseases. For this purpose we selected the chronic conditions mentioned below, and herewith roughly outline our results. To carry on these investigations we decided on a typhoid vaccine as prepared by one of the reliable manufactur s as the most convenient for our use and one that could be obtained without a great deal of laboratory preparation. At any rate, it would be sufficient for a short preliminary study, which was begun in the early part of July.

The patients were taken at random as they entered the hospital, and those selected in which the etiologic origin was more shrouded in mystery or due to a known micro-organism. All the patients were kept in the hospital through the course of treatment and under close observation by the house staff. All of the injections, except with one patient, were intravenous, varying from 75,000,000 to 500,000,000 of the so-called "prophylactic" suspension of the typhoid bacillus.

In none of the cases was there any lasting inconvenience noticed. All the patients had chills accompanied by a sharp rise of temperature from 100 to 105 F. All showed a slight, but not marked rise in the number of leukocytes. In one case, after the second injection, a marked nephritis with some microscopic blood in the urine developed, but the patient quickly recovered under rest and a selected diet. In all, the local lesion, especially in lupus erythematosus, became much redder and sometimes itched and burned

Fig. 4 (Case 3).—Condition after injection.

for from an hour to three hours after the injection. Herpes labialis was a common occurrence after the chills and fever.

CASE 1.—*Psoriasis.*—J. O., man, had previously been treated here for a general, superficial type of psoriasis which improved readily under autoserum and weak chrysarobin. The patient remained well a few months, but the condition recurred, the lesions appearing principally on the arms. On the extensor surfaces of the forearms large plaques with

2. Miller, J. L., and Lusk, F. B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, THE JOURNAL A. M. A., June 3, 1916, p. 1756.
3. Smith, L. D.: The Value of Anaphylaxis in the Treatment of Gonorrheal Complications, THE JOURNAL A. M. A., June 3, 1916, p. 1758.

silvery scales appeared. The plaques were somewhat thickened and the scales tenacious (Fig. 1). Physical examination of the patient was negative. He was given an initial dose of 100,000,000. The leukocyte count was 6,850. He had a severe chill, two hours after the injection, and shook for fifteen minutes. The temperature went up to 102.4. The white

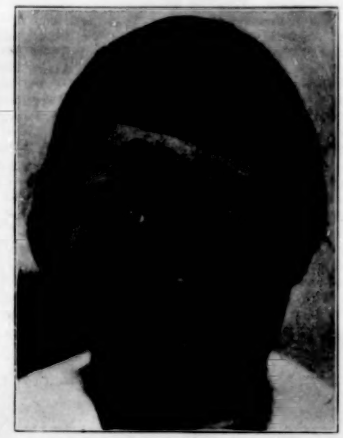


Fig. 5 (Case 4).—Condition of patient with lupus erythematosus before injection.

cell count at six hours was 5,450. On the second day following the injection, the lesions had markedly changed in that the scaling had ceased; infiltration had disappeared, leaving a deep pigmentation, but in one lesion particularly there was left a slight scaly point in which some infiltration remained. The patient developed herpes labialis. On the third day a second injection of the same amount was given. The pigmentation of the lesions increased to darkish brown stains. The cell count previous to injection was 6,440; six hours after, it was 8,800. Five days after the second injection the lesions became slightly scaly again, so a third injection was given, when these areas again cleared up, remaining so for about a week. This result was also encouraging, but the scaling again recurred in the course of a week or ten days, and the patient left the hospital.

Four other patients with psoriasis have been given the same treatment, two answering the description of the case just cited, while the other two seemed to be slightly, if at all, benefited. It is to be noted in the investigation of this disease, however, that on the first or second day after the injection there is a marked blanching of the lesions, less scaling, and a slight disappearance of the infiltration; and even in the resistant cases, dark pigment stains can be seen where certain plaques have disappeared. However, in the most favorable cases, unfortunately, relapse has occurred within a short time. The lesion after involution showed unusually deep pigmentation (Fig. 2).

CASE 2.—*Lupus erythematosus.*—In Mrs. F., the whole face was more or less continuously involved, the disease occupying an area from just in front of one ear, sweeping downward to the chin and upward to the forehead and across the face, from the right ear across to the left in a similar location. The disease had existed for eighteen years. It consisted of an invading border, rather hard and infiltrated, along the periphery of this large plaque. In front of the face there was some atrophy and more superficial scaling, but here and there deeper scar tissue could be seen. On the sides of each cheek, where the patch was much thicker, a more profuse scaling and some little hemorrhagic crusts were plainly outlined. Here and there rather deeper, atrophic scars were to be seen, from the frequent application of carbon dioxid snow in the last two or three years. This case had been treated by many methods, the Roentgen ray and carbon dioxid snow, besides by various external and internal methods. The patient was given 100,000,000. The white count was 6,780. She had a moderately severe reaction. The temperature rose to 101.8 F. The white count six hours after injection was 8,180. The next day the face looked paler and the next three days became smoother, tending to assume its normal color. The red, congested hue had almost entirely disappeared even in the more thickened parts of the lesions. On the fourth day a second injection of 250,000,000 was given. The white count was 10,040; six hours after injection, 14,840. The temperature rose to 103. In two days the face really looked almost normal. The sister of the patient remarked, on visiting her, that she had never looked as well since the face became involved. She was permitted to go home for a week, and returned presenting deep, reddened lesions which had developed in the areas previously frozen by carbon dioxid snow. These gradually crusted over. She was given another injection, but it did not seem to affect the points where the carbon dioxid snow had been used as it did the other parts of the face, owing, probably, to protection to the disease at this point by the scar tissue. Outside of these reddened areas the disease remained as it had been after her first course. The skin became soft and pliable and of normal, pinkish color, and was entirely free from scaling. The thickening and infiltrated border had entirely disappeared. Herpes labialis occurred also in this case.

CASE 3.—*Lupus erythematosus.*—This case was one of an extremely chronic, thickened, discoid type (Fig. 3). The disease had existed for five years. The patient, a woman, had attended the clinic for several years. The initial plaque

Fig. 6 (Case 4).—Condition after injection.

was over the bridge of the nose, the body of the butterfly type, and it gradually spread on each side to the cheeks in a batwing distribution. A few lesions were scattered over the forehead and in the postauricular region. The center of the lesions was cicatricial, and scattered here and there were thickened crusts of a yellowish-creamy tint. The borders

encompassing the whole diseased area were exceedingly thick, almost hypertrophic, the thickest we have ever seen in lupus erythematosus. They were raised above the surrounding skin, hard, infiltrated and rolled. This patient had also a positive Wassermann reaction, but the lesions on the face without doubt would be classed by any one as lupus erythematosus. After the first injection there was marked improvement. The redness markedly decreased, the borders flattened down, the crusting seemed to cease, and edema disappeared. This patient received two courses of three injections each, during and after which there was a progressive improvement. She also, unfortunately, has dropped out of sight and has not returned to the hospital as yet; and, although the symptoms of the disease had not entirely disappeared from the skin, yet the improvement was so marked that it was dramatic (Fig. 4). The hard, rolled border and deep color had disappeared and crusting ceased.

CASE 4.—A woman, aged 20, had had a peculiar condition of the skin for fourteen years. In the early observation of the case no diagnosis was made (Fig. 5). The disease consisted of a peculiar thickening of the skin of the front of the face, including the nose and the vermilion border of the lips. It was slightly scaly and all the lines of the skin were much deepened, so much so that one would think of some peculiar degeneration or almost one of the type of nevi. The color was a deep purplish pink, the intensity varying from time to time. The diagnosis of lupus erythematosus had been provisionally made, and we decided to give the protein injections. The patient had been treated frequently during her various trips to the hospital by the Roentgen ray, without any marked improvement. Four injections were administered. The face became greatly improved in every way. The skin assumed a velvety feel (Fig. 6), lost its erythematous color, the scaling and edema disappeared, and the lines of the skin became normal. The patient was allowed to go home for a week, and returned somewhat worse than she was when she left the hospital. She is a large, rugged girl and does a man's work in the field. She received another injection of the protein, when the skin again became normal. She was dismissed, but returned a few days ago, having been absent from the clinic for several weeks. Her face at this time was in an excellent condition. There had been no relapse except two small areas about the size of a quarter-dollar symmetrically distributed on each side of the cheek. In other portions of the face there seemed to be no evidence of the former condition.

CASE 5.—A woman had a peculiar type of lupus erythematosus, symmetrically distributed on the sides of both cheeks, always worse in warm weather. It had been known to disappear completely during the winter. The lesions were sharply circumscribed, symmetrical, and began as small papules which coalesced and formed patches the size of a half-dollar. The latter condition existed when we first saw her. The patches were raised, of a purplish red, very sharply circumscribed and somewhat infiltrated. The classification would probably be in the borderline cases, spoken of by English writers, between chronic erythema multiforme and a lupus erythematosus. The condition has existed off and on for fifteen years. There is no atrophy or subjective sensation. The patient was given two intramuscular injections, without apparent effect on the lesions, but they rapidly disappeared after one intravenous injection of 400,000,000. The patient was seen a few days ago, eight weeks after the injection, and the site of the former lesions was marked only by slight dots of pigmentation. They had entirely disappeared. The skin was soft, pliable and normal, with the exception of the slight deposit of pigment.

CASE 6.—A middle-aged woman had the batwing variety of the disease. Over both cheeks was an infiltrated, reddened area which joined a more advanced stage of the process on the nose. All the skin of the nose was involved in a thickened, scaly, crusted, sharply defined patch of lupus erythematosus in which there were, here and there, parchment-like areas of atrophy (Fig. 7). The disease had existed for many years, and had been treated at the hospital by various methods, with the usual success and discouragement. This patient had three injections, one of 200,000,000, and two of 400,000,000. Each was followed by a sharp reaction with a chill and a rise of temperature to 102 or 104 F. She was in the hospital ten days. Within four days the condition on the cheek was replaced by slight pigmentation, the redness had markedly decreased, and the crusts on the nose began to desquamate (Fig. 8). The patient left the hospital, September 25, wonderfully improved. The skin on the cheeks was normal. The infiltration had disappeared, and the area was marked by a slight, dirty yellowish pigment. Almost all of the scales and crusts had exfoliated from the skin of the nose, leaving a soft, pliable epidermis which still remained pinkish, but the hue was not that of a lupus erythematosus. The filtration here had entirely disappeared (Fig. 9).

Fig. 7 (Case 6).—Condition of patient with lupus erythematosus before injection.

Fig. 8 (Case 6).—Condition after first injection.

Fig. 9 (Case 6).—Condition of patient on dismissal.

CASE 7.—A middle-aged woman had lupus erythematosus consisting of a crusted, scaly plaque about the size of a silver half-dollar on the left side of the nose. The sharply circumscribed borders were raised and scaly, with several scaly points within the circular patch. This patient was in the hospital with Patient 6, and left September 26, the lesion having been replaced by some slight pigmentation with a slight scaly point, as big as a millet seed, on the upper, inner part of the lesion.

In an old woman a case of parapsoriasis of several years' standing and of general distribution had been markedly

influenced by the injections. The lesions are paler, less scaly, and the thickening is greatly decreased. The patient is still under observation, and will be given further injections.

A patient with dermatitis herpetiformis, involving and exacerbating, seemed slightly improved. Only two injections could be given, as the patient had to leave the hospital.

A patient with Darier's disease was given an injection which seemed to stimulate the formation of lesions.

Three patients with syphilis in various stages of the disease were given injections. An early, profuse, macular eruption faded somewhat, and some of the lesions were replaced by pigment.

A patient with a tubercular syphilid of the skin was given two injections, after which a rapid disappearance of some of the lesions occurred, leaving very deep, dark pigmentation.

A patient with acute, exfoliated dermatitis showed great improvement. There was a profuse, erythematous, exfoliating condition involving the skin from the neck down, accompanied by marked itching. There was also some exudation. The injections seemed to relieve the itching, and the disease became rapidly paler and finally disappeared. The most marked feature was the cessation of desquamation and the increase of perspiration; but as this condition frequently occurs without any treatment, it is very difficult to draw conclusions.

We report these investigations merely as a matter of general interest. To what the change in the lesions may be attributed, whether to hyperpyrexia, the mobilization of ferments, colloidal dispersion, specific effects in some way on the capillary vessels of the skin, the setting into operation of immunizing forces, whatever they may be, we are unable to say. But we are sure that the process awakened by the injection of this protein ("split products" of Vaughan) has to do with some fundamental principle which should be elucidated. This fundamental principle probably opens the way to more exact therapy in many diseases.

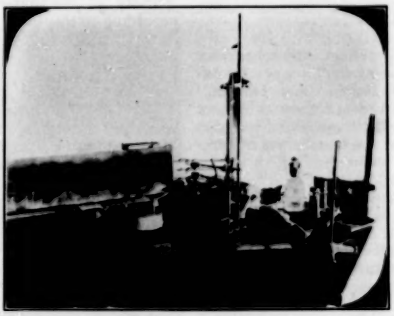


Fig. 1.—Apparatus for making myograms.

When one has observed from day to day the remarkable effects produced in some of the cases above cited, one cannot help but be impressed with the fact that one is dealing with a method which undoubtedly promises much for future investigation. To see a chronic patch of lupus erythematosus which has existed for years clear up or partially disappear after one or two injections of a small amount of foreign protein, such as the typhoid organism, is in itself startling. All these patients may have a relapse. In fact, one of them who appeared in the clinic recently has partially relapsed, but that does not change the fact that the condition was rapidly and markedly benefited by this method. We are now preparing to carry on similar investigations with nonspecific and nonbacterial proteoses.

The method is not recommended as a form of treatment for any disease. The report is made to stimulate study and further investigation, which should be done only under rigorous care in a well equipped hospital.

The Process of Thinking.—All thinking is a kind of wrestling between opponent thoughts.—G. Hauptmann.

CEREBELLAR LOCALIZATION

AN EXPERIMENTAL STUDY BY A NEW METHOD *

I. LEON MEYERS, M.D.
Instructor in Diseases of the Nervous System, Rush Medical College
CHICAGO

Unlike the doctrine of cerebral localization, which was founded on direct experimental evidence, the motor responses being obtained on stimulation of the cerebrum, the theory of cerebellar localization was evolved through studies in embryology and comparative anatomy. It was first formulated, in 1903, by the Dutch anatomist Bolk[1] who, from a study of the cerebellum in numerous types of mammals, deduced the theory that the developmental variations of its different lobules bear a relationship to the various muscle complexes in the body.

It is obvious that the theory requires for its verification experimental proof. The theory also presupposes that the function of the cerebellum is to coordinate muscle groups in their synergistic action. This is a supposition which is still subject to dispute, a point raised by Van Rynberk.[2]

PREVIOUS METHODS OF STUDYING CEREBELLAR LOCALIZATION

Stimulation Experiments.—The striking success that has attended the electric method of excitation in mapping out the various motor zones of the cerebrum has naturally led investigators to utilize the same method for the study of localization in the cerebellum. The first to study the problem by this method was Ferrier,[3] who tested the electric excitability of this organ in birds, fishes and mammals, including apes.

Among others who studied the problem in this manner were Wersiloff,[6] Pruss,[7] Negro and Rosaendo,[2] Clarke and Horsley,[8] Rothmann[5] and Uffenorde.[9] Their results, on the whole, were far from uniform and frequently contradictory. For example, Wersiloff obtained movements of the hindlimb on excitation of the vermis superior, Pruss on excitation of the lobus quadrantus, and Uffenorde, of the alae lobuli centralis, while Rothmann evoked such movements from the posterior part of the hemispheres and vermis exclu-

* From the Hull Physiological Laboratories, University of Chicago.
* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.
* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

1. Bolk, L.: Das Zerebellum der Säugetiere, Jena, 1906. For other articles by Bolk, dealing with this subject, see Footnote 2.
2. Van Rynberk, G.: Ergebnisse der Physiologie, 1908, vii, 675, Asher-Spirós, Wiesbaden; ibid, 1912, xii, 536. Appended to these articles will be found an extensive bibliography bearing on the question of cerebellar localization.
3. Ferrier, D.: Functions of the Brain, Ed. 2, 1886, p. 186.
6. Wersiloff, N. M.: Neurol. Centralbl., xviii, 328.
7. Pruss: Abstr., Neurol. Centralbl., 1903, p. 268.
8. Clarke, R. H., and Horsley, Sir V.: Brain, London, 1908, xxxi, p. 121.
9. Uffenorde: München. med. Wchnschr., 1912, lix, 1279.

sively, and then only in association with movements of the forelimbs.

Extirpation Experiments. — Another method employed for the study of cerebellar localization, and one which has indeed furnished a number of valuable data in connection with this problem, is the method of partial exclusion, or the production of small, circumscribed lesions of the various lobules of the cerebellum followed by a study of such motor disturbances

Fig. 2.—Myogram of an absinthe convulsion in a normal animal, based on a study of four normal cats.

as resulted from them. This method, which has been employed by Luciani,[11] Van Rynberk,[2] Luna,[2] Lourié,[12] Hulshoff Pol,[2] André-Thomas and Durupt,[13] Rothmann[5] and others, has proved of great value, not only for the study of cerebellar localization, but also in extending our knowledge of the phenomena of cerebellar lesions. It disclosed a number of variations from the normal which had not been appreciated before, such as head astasia, the cock's gait and the "military salute," the animal when excited raising its forelimb to the level of the ear, first described by Van Rynberk. In general, these studies tended to confirm the theory of cerebellar localization as postulated by Bolk. They differed, however, as to the strict localization of the various centers. The reason for this is to be found in the fact that the disturbances resulting from very small and circumscribed lesions of the cerebellum are exceedingly slight, if detectable at all. In my experiments on the cat, after the production of small, circumscribed lesions in the lobules of the hemispheres such as are reported in this communication, no disturbances whatever were observed, either in station, gait or general motility of the animal. The animals, in my experiments, aside from their enfeebled condition as a result of the operation, which in the case of the cerebellum is always one of great severity, showed no deviation from the normal. They walked up and down an inclined plane, jumped from a height and stood up on their hind legs when food was held up in front of them in a perfectly normal manner. As is well known, Luciani, who had an extraordinarily rich experience with cerebellar extirpations, was opposed to the view of cerebellar localization. He maintained that the cerebellum is a homogeneous structure, all segments of which function alike, so that deficiency of one is quickly compensated by the remaining intact portions. This is in entire accord with my observations, so far as they relate the gross phenomena generally looked for.

From these facts it is clear that neither the stimulation experiments nor the extirpation experiments have furnished the undoubted proof of a functional differentiation in the cerebellum, that they furnished for establishing localization in the cerebrum. This, I believe, should point to a fundamental difference in the function of these two organs.

THE AUTHOR'S CONCEPTION OF THE CEREBELLAR FUNCTION

In a recently published communication[14] I advanced the view, based on experimental evidence which I obtained by galvanometrically determining the electric potential on the two sides of the body after unilateral oblation of the cerebellum, that the cerebellum does not, as is generally assumed, act motorially on the periphery, but that it acts primarily on the motor and tonus centers of the encephalon (motor cortex of the cerebrum, paracerebellar nuclei and possibly also the nuclei of the midbrain), its function being to inhibit or control and regulate the activity of these nuclei, and that the phenomena of cerebellar deficiency are therefore to be interpreted as phenomena of hyperactivity of the latter structures. The cerebellum, according to this view, is a purely afferent mechanism, bearing in a broad sense the same relationship to the motor (and tonus) nuclei of the encephalon that a posterior root ganglion does to the motor cells of the anterior horn of the cord.

If this conception of the cerebellar function is correct, our failure to obtain constant and definite responses on excitation of the organ at once becomes clear. The cerebellum being an afferent, sensory structure, the motor effects obtained on its excitation are obviously due to the transfer of the stimulus to the subjacent structures, and not to stimulation of the cerebellum itself, and are therefore vague and indefi-

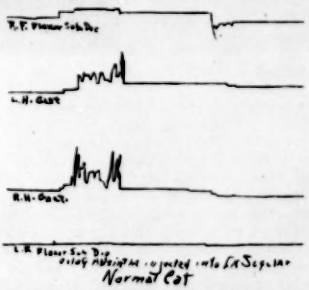


Fig. 3.—Myogram of an absinthe convulsion in a normal cat, in which the contractions of the flexors (of forelimbs and hindlimbs) exclusively were recorded.

nite, just as the diffuse and ambiguous movements obtained on excitation of the central end of a divided posterior root are due primarily to the effects of the stimulus on the motor cells of the cord. The fact (and this is admitted by all observers) that a far more powerful current is required to evoke a motor response from the cerebellum than is required for a similar

11. Luciani, L.: Human Physiology, iii; Engl. Transl. by Frances A. Welby, New York, The Macmillan Company, 1915.
12. Lourié, A.: Neurol. Centralbl., 1907, xxvi, 652.
13. André-Thomas and Durupt: Neurol. Centralbl., 1914, xxxiii, 208 (ref.).

14. Meyers, I. L.: Galvanometric Studies on the Cerebellar Function, THE JOURNAL A. M. A., Oct. 16, 1915, p. 1348.

response from the cerebrum also lends support to this view. It is well known that with powerful currents motor responses are also obtained from the sensory regions of the cerebrum, such as the parietal and temporosphenoidal lobes, the effects being admittedly due to the diffusion of the current to the neighboring motor zone.

To follow up this argument, if the conception of the cerebellar function as presented in my last communication is correct, the question of cerebellar localization should be studied through the medium of the motor cortex of the cerebrum, paracerebellar nuclei, etc., in order to determine whether or not after a circumscribed lesion of the cerebellum, the muscle group which, according to Bolk's hypothesis, is related to the site of the lesion, is in a state of functional hyperactivity, and also, if such hyperactivity is present, whether or not this is absent in other muscle groups.

To take a concrete example: The functional relationship of the musculature of the leg with the leg area of the contralateral hemisphere of the cerebrum is determined, after a lesion of the latter, by the spasticity (increased reflexes, muscular rigidity and clonus) of the leg affected; in other words, by phenomena of hyperactivity of the motor cells in the lumbar enlargement, due to their release from inhibition by the muti-

Fig. 4.—Myogram of a generalized absinthe convulsion in a cat with a circumscribed lesion of the left lobulus paramedianus.

lated leg center in the cerebrum. Similarly, the functional relationship between the musculature of the leg and the homolateral crus secundum (Bolk's hypothetic leg center in the cerebellum) should be found in phenomena of hyperactivity of the leg center, and no other, of the contralateral hemisphere of the cerebrum caused by its release from inhibition by the mutilated crus secundum. Clinically, such hyperactivity of the cerebrum exhibits itself in disturbances of ataxia, the cerebellar gait, disturbances of equilibrium, hypermetria, etc.

The symptoms described do not appear in any but severe lesions of the cerebellum and are not therefore available for the study of cerebellar localization. The state of activity of the various motor centers of the cerebrum, and also that of the tonus centers in the medulla[15] (the paracerebellar nuclei, which Thiele[16] by his studies of decerebrate rigidity demonstrated to be the tonus centers for the musculatures of the body) might be studied, however, by another method, namely, by noting the effects of exciting these centers by oil of absinthe, a convulsant which is known to exert its influence on these particular centers. The poison, owing to this particular mode of action, which has been established by the researches of Magnan,[17] Bechterew,[18] Gotch and Horsley,[19] Rubert Boyce,[20] Leonard Hill,[21] Bouché[22] and others, has been extensively employed in studies of brain physiology. When injected into the circulation, this poison produces convulsions which affect all the muscles of the body, are accompanied by unconsciousness, are of both clonic and tonic character, and present an appearance strikingly similar to that of convulsions in idiopathic epilepsy. These studies demonstrated that the clonic convulsions, which, on direct excitation of the cerebrum, are obtained only from the motor cortex and not from the corona radiata or any of the subjacent structures, are due to the effect of the poison on that part of the brain. Excision of the motor cortex of one hemisphere eliminates or reduces to a minimum the clonic convulsions on the opposite side of the body. Leonard Hill beautifully illustrated this fact by varying at will the clonic or tonic character of the convulsions by alternately leaving open or clamping the arterial supply of the cerebrum. The tonic convulsions, on the other hand, are due to the effect of the poison on the tonus centers in the medulla. Section of the cord below the bulb promptly abolishes all convulsions, tonic as well as clonic, in all the muscles connected with it below the line of section (Boyce and others). The poison, introduced into the blood, is carried of course to all parts of the brain and acts simultaneously on all the centers that are influenced by it. The hyperactivity of a certain center should consequently be followed by a greater response in its corresponding muscle groups.

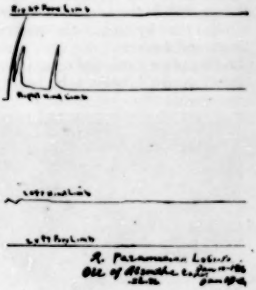


Fig. 6.—Myogram of a localized absinthe convulsion from a cat with a small lesion of the right lobulus paramedianus.

I accordingly carried out my experiments as follows: I first produced small, circumscribed

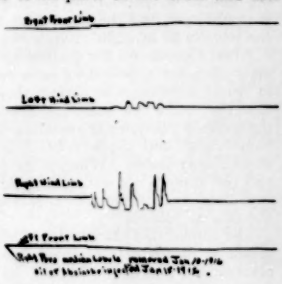


Fig. 7.—Myogram of absinthe convulsion from the same cat from which the myogram shown in Figure 6 was obtained, after the order of attachment of the gastrocnemii to their respective levers had been reversed.

15. The state of activity of the various motor centers exclusively could probably be determined also by direct excitation of the cerebrum, or the galvanometric determinations of their electrical potential.
16. Thiele, F. H.: Jour. Physiol., 1905, xxxii, 355.

17. Magnan, V.: Arch. de physiol. norm. et path., 1873, v, 115.
18. Bechterew, V.: Neurol. Centralbl., 1895, xiv, 394.
19. Gotch, F., and Horsley, V.: Phil. Tr. Roy. Soc. London, 1891, clxxxii, 511.
20. Boyce, Rubert: Brit. Med. Jour., 1893, ii, 1097; Neurol. Centralbl., 1894, xiii, 466; Phil. Tr. Roy. Soc., London, clxxxvi, 363.
21. Hill, Leonard: Phil. Tr. Roy. Soc., London, 1900, cxciii, 102.
22. Bouché and Horsley: Brain, London, 1906, xxix, 453.

lesions of certain lobules of the cerebellum, using cats in all the experiments. The organ was reached by cutting the skin over the occipital region in the median line, severing the large mass of muscles on the posterior side of the neck at their attachment at the lambdoid suture, and, after retracting them downward and outward as far as possible, opening the skull by means of a small trephine one-third inch in diameter. I found that by this route only could I reach the lobulus paramedianus and the crus secundum without injuring at the same time the crus primum. An injury to the latter could, however, be produced by an opening just above the lambdoid suture. To produce a circumscribed lesion of the crus secundum I trephined the skull just above the foramen magnum, a few centimeters away from the median line. Caution should be taken in trephining here not to injure the medulla, which generally produces instantaneous death of the animal. The opening exposes a small part of both the lobulus paramedianus and the lobulus circumcludens or paraflocculus, and a lesion of the crus secundum can be made by injuring the area just above the latter lobule and external to the former. An injury to the lobulus paramedianus can generally be made without much difficulty after trephining the skull just above the area described for a lesion of the crus secundum, and an injury to the crus primum, after making an opening directly below the lambdoid suture. To make a trephine opening, at a considerable distance from the median line, which would expose the crus secundum or the outer part of the crus primum, is not, as a rule, a safe procedure, as it is accompanied by a hemorrhage too severe for the animal to survive. Therefore, only the lobulus paramedianus and the inner part of the crus primum can usually be brought to view.

Fig. 8.—Brain of cat with lesion of right paramedian lobule (Myograms 6 and 7).

After I produced the desired lesions, I kept the animals alive for a period of time varying from a week to twelve days to make certain they would recover and that they were not suffering from meningitis. Only the general phenomena resulting from the operation, hemorrhage and shock from loss of cerebellar substance, were noted. When these phenomena subsided and the animals showed unmistakable signs of recovery, they were subjected to the action of the oil of absinthe as follows:

The animal was placed under ordinary surgical anesthesia by means of a tracheal cannula.[23] It was then placed on a board, the ventral surface down and the limbs tied to hooks at each side so that limbs as well as body were extended to their utmost capacity. The trunk of the animal was tied securely to the board by means of two strips of bandage, which encircled it, one at the upper part of the chest, the other at its posterior end. This arrangement effectually prevents the movements of the trunk during a generalized convulsion from being communicated to the limbs. It also prevents all possible voluntary movements. In a number of experiments added caution was taken by nailing the limbs to the board. This is unnecessary, however, if the limbs are thoroughly extended.

With the animal in this position, two symmetrical, representative muscles from the forelimbs, such as the extensores communes digitorum, and a similar pair of muscles from the hindlimb, the gastrocnemii, were cut at the points of insertion. These muscles had been separated, by means of the fingers, from the surrounding tissues as close to their origin as possible earlier in the experiments, and kept from drying and cooling by normal salt solution at the body temperature. Their lower ends were attached to silk threads, any one of which was made to pass over two pulleys, fastened to two ringstands as shown in Figure 1. The threads were then connected to muscle levers. The levers, which were weighted down by small weights of equal size (7 or 10 gm.) to keep the muscles under a fair degree of tension, and equally calibrated, were made to write on a revolving drum covered with smoked paper. In order to eliminate possible frictional difficulty, caution was always taken that the threads, except for contact with the pulleys, should be free throughout their course from contact with anything else in the apparatus. Similarly, in applying the salt solution to the muscles, care was taken that it be applied very gently in order not to disturb their tension. The oil of absinthe was then injected into the external jugular or popliteal vein, a drop at a time (from 1 to 3 drops are generally required to bring about convulsions in the normal cat; from 3 to 6 drops in the animal operated on and enfeebled), and the convulsions, whenever present, were noted both visually and by their records on the drum. They were found to correspond. Before proceeding, however, with a discussion of the results in animals with cerebellar lesions, it will be necessary to study a myogram of an absinthe convulsion in a normal animal.

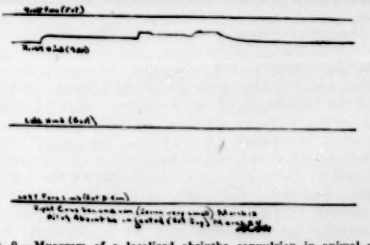


Fig. 9.—Myogram of a localized absinthe convulsion in animal with a lesion of the right crus secundum.

A study of this myogram (Fig. 2) reveals the following characteristics:

1. The effect of the poison exhibits itself simultaneously in all the muscles of the body. All the muscles are in convulsions whenever the intensity of excitation is sufficient to bring about this motor effect, and are quiescent whenever the motor excitation is not sufficiently intense. This is a rule to which, in my experience, there are no noteworthy exceptions.

2. The convulsions of a symmetrical pair of muscles, such as the two gastrocnemii or the two extensores

23. Profound narcosis generally prevents the appearance of convulsions, either because of the profound depression of the cerebrum or as a result of the low vitality of the animal. The latter view is probably correct.

communes digitorum, are of the same character and intensity. The contractions of the gastrocnemii, muscles much larger than the extensors of the forearm, are of course much greater than the contractions of the latter muscles, but there is, practically speaking, no difference in the contractions of the symmetrical muscles on the two sides.

3. The convulsions set in within from thirty seconds to two or three minutes after intravenous injection of the poison. They consist of a series, varying in number, of clonic, followed by tonic contractions. The first series, after a short period of relaxation, is frequently followed by another series, and this, in a similar manner, by another, each series having the same characteristics as the first. At the termination of the convulsive state the animal is quiescent, but now and then, even without the administration of an additional dose of the poison, another cycle starts up, similar to the first. The animal may collapse and die even before the appearance of the convulsions, or may live for a considerable time.

4. The myogram, which records the contractions of the gastrocnemii (flexors) and the contractions of the extensors, two pairs of muscles of an antagonistic function, also illustrates the law of reciprocal innervation of the antagonists as taught by Sherrington.[24] The innervation of the flexors, whether through reflex activity or excitation of the cerebrum, is, according to this law, associated with simultaneous inhibition and relaxation of its antagonistic extensors; and vice versa, the innervation of the extensors with inhibition and relaxation of the flexors. The inhibitory effect in the latter instance, however, is not nearly so marked as in the first, owing to the fact that the flexors are more powerful muscles than the extensors, and their active innervation is accordingly associated with a more pronounced reciprocal effect on the latter muscles.

Fig. 11.—Brain of cat from which myogram shown on drum was obtained.

A study of the myogram shows that simultaneously with a clonic contraction of the gastrocnemii, there is a depression and relaxation of the extensores communes digitorum, and their levers go below the abscissae;[25] also that the contractions of the latter, when their levers rise above the abscissae, correspond with the relaxation of the gastrocnemii. This, as shown in the myogram, is repeated a number of times. Inhibition of the extensors is now and then noted (as shown in Figure 2) when the innervation of the flexors is not sufficiently intense to bring about their obvious contraction, a fact which has been observed also by Sherrington in his studies of inhibition through reflex excitation. The action of the oil of absinthe is thus essentially different from that of the spinal stimulants, such as strychnin or tetanus toxin which, as is well known, are destroyers of reciprocal innervation.[26]

These various phases of the absinthe convulsion should, I believe, in the light of well established physiologic facts, be explained as follows:

In accordance with the pharmacologic law of dissolution, drugs acting on the brain (alcohol, ether, chloroform, morphin, etc.) first affect the higher centers, the centers which in the process of evolution are the last to attain maturity. In like manner, this poison exerts its influence first on the motor cortex of the cerebrum. The excitation of this part of the brain which, as described by Sherrington, predominantly innervates the muscles that are concerned in "transient, phasic" movements (or "changing" movements, according to Hughlings Jackson[27]) produces a clonic contraction of the flexors with a simultaneous inhibition of the extensors. The poison next affects the lower centers, those that in the process of evolution mature early, the tonus centers in the medulla, which predominantly innervate the extensors, the set of muscles employed "in steady, tonic action and maintenance of attitude" (Sherrington), or in "continuous movements" (Jackson). This produces a contraction, chiefly tonic in character, of the extensors with a simultaneous depression of the flexors. The depression in this case is not nearly so pronounced, however, as that which is associated with the contraction of the more powerful flexors. The inhibition of the extensors in the latter instance is so great that their levers fall below the abscissa, while that of the flexors, which results from the comparatively mild innervation of the weak extensors, is but slight and their levers remain above that line. These phases of the myogram are repeated until the effect of the poison wears off.

In view of these facts, a lesion of the crus secundum, for example, should, in accordance with Bolk's theory of cerebellar localization, and the view of the cerebellar function presented in my last communication, result, after intravenous injection of absinthe, either in a greater intensity of the convulsions, both clonic and tonic, in the muscles of the homolateral hindlimb, or in the presence of convulsions in these muscles while the rest of the body is quiescent. A lesion of the crus primum should be followed by similar results in the muscles of the homolateral forelimb, etc.[28] The results in my experiments, as shown in the myogram, any one of which is illustrative of all others in the same type of a lesion, are, in general, confirmatory of both these suppositions.

It will be noted that the contractions of the left gastrocnemius were far greater than those of the right gastrocnemius, whereas the contractions of the extensors were practically alike, clearly indicating a relationship between the lobulus paramedianus with the homolateral hindlimb.

A generalized convulsion in the animal operated on, with its low state of vitality, is, however, very difficult to obtain, owing to the fact that the oil of absinthe,

24. Sherrington, C. S.: Integrative Action of the Nervous System, New York, 1906, p. 85; ibid., p. 282.

25. It is, of course, understood that while the myogram records the contractions of the flexors of the hindlimbs, the flexors of the forelimbs, not recorded, are also in convulsions.

26. That the depression shown in one group of muscles during the contraction of the antagonistic group is due to reciprocal inhibition is proved by the fact that in myograms of absinthe convulsions in which contractions of the flexors exclusively were recorded (the gastrocnemii as the flexores sublimes digitorum), all the levers rise and fall simultaneously (Fig. 3).

27. Jackson, Hughlings: Med. Exam. and Pract., April 5, 1877; Med. Times and Gaz., 1878, ii, 485; Brain, London, 1906, xxix, 425.

28. The convulsions resulting from intravenous injection of absinthe after complete removal of a lateral lobe have been studied by Risien Russell, who found them to be much more intense on the side of the lesion (Phil. Tr. Roy. Soc. Lond., clxxxv, 842). They were found to be identical on both sides by Rubert Boyce (Phil. Tr. Soc. Lond., clxxxvi, p. 370).

which is a powerful narcotic poison, when administered in comparatively large doses, generally kills the animal without giving rise to convulsions. It was therefore thought preferable to administer the oil in very small doses and note whether convulsions would appear in one muscle group while the others remain unaffected.

A myogram of such a localized convulsion is shown in Figure 6.

It will be seen from this myogram that whereas both extensors were quiescent, both gastrocnemii were in contractions. The muscle on the side of the lesion contracted, however, much more vigorously than the corresponding muscle on the other side, this fact again indicating a relationship between the lobulus paramedianus and the homolateral hindlimb. To make certain that there was no mechanical difficulty present which might have prevented the recording of the left gastrocnemius and which I might have failed to observe visually, I reversed the order of the attachment of the two gastrocnemii to their respective muscle levers and took a myogram of another series of convulsions. The myogram (Fig. 7) shows the same characteristics as the preceding one.

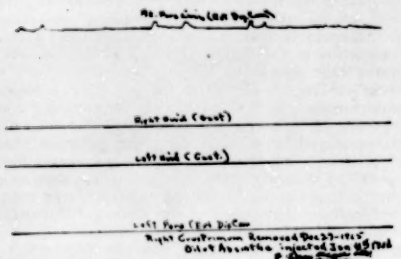


Fig. 12.—Result in an animal with a small circumscribed lesion of the right crus primum.

The last two myograms are, with but two exceptions, typical of all the other records of localized convulsions in animals with a circumscribed lesion of the lobulus paramedianus, three of which had a lesion of the left lobule and one, a lesion of the right. It is characteristic that, during the convulsive state, whereas the extensors are perfectly quiescent, both gastrocnemii are in convulsions, the homolateral muscle being affected, however, to a much greater degree than the contralateral muscle. In the two exceptions referred to, the homolateral gastrocnemius was contracting while the contralateral muscle, as well as the extensors, were quiescent. This last type of localized convulsions was, however, the rule in the two animals with a lesion of the crus secundum.

It will be seen that here the right extensor communes digitorum was in convulsions, although the rest of the body was completely at rest. Contractions of the muscle of the type shown in the myogram have been recorded throughout the whole extent of the drum. An identical tracing, with the contraction of the left extensor communis digitorum and the rest of the muscles quiescent, was obtained from an animal with a lesion of the left crus primum. A relationship is thus shown between the crus primum and the homolateral forelimb.

Figure 14 is of special interest. This myogram was obtained from a cat with a comparatively large lesion of the left crus primum, as shown by the photograph of the brain, which careful examination has shown to have involved also the superior part of the left paramedian lobules.

The record shows that whereas the right extensor communis digitorum was perfectly quiescent, the left was in a state of intense convulsions, its contractions being much greater than those of the voluminous and powerful gastrocnemius. This condition is never observed in a normal animal. It shows also that both gastrocnemii were, at the same time, also in convulsions, the homolateral muscle contracting, however, much more vigorously than the contralateral one. The myogram thus represents the result of a combined lesion of the left crus primum and the left paramedian lobules.

The various myograms show the greater intensity of the convulsions in the muscles related to the site of the lesion exhibited itself in both their clonic and tonic contractions, but mainly in the first type.

In another animal with a lesion of the lobulus medianus posterior the oil of absinthe produced intense convulsions in the posterior of the trunk, although the muscles of the limbs were apparently unaffected. These convulsions were observed visually and I have no graphic record of them.

The lobules studied in these experiments have the following homologues in the human cerebellum: The lobulus paramedianus corresponds to the tonsil or amygdala, the crus secundum to the lobulus biventer, and the crus primum to the lobulus semilunaris superior et inferior and the lobulus gracilis.[2]

SUMMARY AND CONCLUSIONS

1. The function of the cerebellum is to inhibit, control and regulate the activity of the motor cortex of the cerebrum and the paracerebellar nuclei in the medulla.

2. The phenomena of cerebellar deficiency are, accordingly, to be interpreted as phenomena of hyperfunctional and not hypofunctional activity.

Fig. 13.—Brain of cat with lesion of right crus primum.

3. The cerebellum is functionally differentiated for the various muscle groups of the body, indirectly, by being primarily related through its various lobules to the various motor centers in the cerebrum and the tonus centers in the medulla, just as a posterior root ganglion is, in a motor sense, related to a certain muscle complex through its corresponding group of motor cells in the anterior horn of the cord.

4. The paramedian lobule is, in this manner, related to its homolateral hindlimb, and probably also to the contralateral hindlimb; the crus secundum to the homolateral hindlimb, very likely, exclusively, and the crus primum to the homolateral forelimb.

5. These results are in general in conformity with the theory of cerebellar localization as postulated by Bolk. They differ from it only as regards the paramedian lobule, which Bolk assumed was the center for unilateral movements of the muscles of the trunk.

It might be well to state in this connection that this study might prove to be of distinct practical importance. It is possible that in suspected cases of cerebellar tumor or disease in which the phenomena of cerebellar deficiency, the ataxic gait, the hypermetria, the adiadokocinesis in the arms, etc., are too slight to be recognized, the administration within physiologic limits of a cerebral excitant, such as the vinous preparation of absinthe or even ordinary alcohol in moderate doses, might make these phenomena obvious and thus aid us not only in diagnosing an affection of the

Fig. 14.—Myogram of localized absinthe convulsion of the left crus primum; the superior part of the left paramedian lobule was also involved.

organ but also in establishing the exact seat of the disturbance.

ABSTRACT OF DISCUSSION

DR. CHARLES K. MILLS, Philadelphia: Dr. Meyers in a general way takes somewhat the position which Dr. Weisenburg and I took with reference to the matter of cerebellar localization. He seemed to be distinctly advocating a localized control of certain movements through the control of specific cortical and other centers. The cerebellum controls in certain of its parts certain synergic movements. The elements of the synergic movements have differentiated centers in the cerebrum. The cerebellum in any of its centers does not control separately and distinctly an impulse which would cause such a movement of the index finger as flexion or extension, alone, but the particular duty of the cerebellum is to regulate that movement in so far as it may be associated with other movements. In other words, cerebellar centers represent more or less complex synergic movements. Crocq pointed out that the centers of tone are distinctly different in location in lower animals, and as we go up in the scale, as in the frog, the dog or cat, the ape, etc., until we reach man. The mechanism of tone in the human being is different from that for the lower animal, but man may be reduced to the lower animal scale by certain lesions, and become more or less automatic and reflex in his activities. In complete bilateral flaccidity due to a total transverse lesion of the cord and in hemiplegic flaccidity due to a total destruction of the internal capsule, tonectic impulses can no longer be conveyed to the limbs affected, although they may be received by the pyramidal system above the side of the lesions.

DR. TOM A. WILLIAMS, Washington, D. C.: Dr. Meyers seemed to make little of the clinical manifestations of alteration of tonus; and yet he attributes all the disorders expressing cerebellar lesions as due to interference with tonus. If that were the case, we ought to find clinically in cases in which there are disorders of motility definitely established as due to cerebellar lesions at postmortem, very marked interference with tonus. For example, is it conceivable that such marked interference with motility, as occurs when there is a complete suppression of labyrinthine deviation from central lesion, can be attributed to disordered tonus when there is no demonstrable disorder of tonus clinically? Therefore we should look a little farther, perhaps, than mere alteration of tonus for such marked symptoms as the loss of normal conjugate deviation on labyrinthine stimulation. Even supposing that such lesions do involve the paracerebellar nuclei, yet even there one should be able to demonstrate a difference of tonus on the two limbs of that individual who shows such symptoms. Will Dr. Meyers be more explicit regarding what he has said in relation to the objection? There are many other questions aroused by this research, but I think the factor mentioned is the most important.

DR. CHARLES K. MILLS, Philadelphia: The paracerebellar nuclei are, I believe, distinctly related to the distribution of the vestibular nerve, and they have special functions which have actually been demonstrated not only by the Bárány methods, but by other clinicopathologic investigations. The function of this nucleus complex is different from that of tonus in my interpretation of the word. And we must reconcile the reasoning which Dr. Meyers has advocated with the observations of the other sort bearing on this subject.

DR. I. LEON MEYERS, Chicago: Dr. Mills expresses the belief that the cerebellum controls synergy of movement. My aim was not to deny the control of synergy of movement—it was to analyze synergy. What does synergy mean? As stated in my last paper, synergy is extensive work and can not be expressed in the terms of a single neuron effect. It implies that the whole cerebellum works at the same time. Nerve activity in a single neuron is limited, and could only act on one single muscle fiber. My idea was to show that the cerebellar function is that of coordinating movements in a manner similar to the coordination of movement in the heart by the inhibitory effect of the vagus. The voluntary movements of the skeletal muscles it seems are the result of two antagonistic forces: the cerebellum and the cerebrum, just as the activity of the heart, and probably also that of the plain muscles of the stomach, intestines, etc., are the resultant effects of two antagonistic forces, the sympathetic and the vagus. This resultant effect may be called synergy, but the primary activity is that of acceleration of movement, and inhibition of movement. Owing to lack of time I omitted one point. One or two tracings were introduced to show that following cerebellar lesions there is, in the absinthe fit, an increase also of the tonic contractions, indicating that the cerebellum checks also the impulses of tonus. This, as stated in my paper, has been demonstrated before by Thiele by his studies of decerebrate rigidity. That the paracerebellar nuclei are the center for tonus stimuli has been held long ago by Ewald, who advanced the idea of labyrinthine tonus, the Deiter's complex being merely a station in the labyrinthine mechanism. But the chief action of the cerebellum seems to be on the motor cortex, as shown by the tracings in which a much greater intensity is noted in the clonic than in the tonic contractions. I should also like to add that in several experiments the lesions were too small to be photographed, and no symptoms whatever were to be observed. On injection with absinthe, however, there was prompt reaction on the side of the lesion. With reference to the cerebellar localization it must be accepted in the same sense as Horsley viewed it—as sensory centers with their primary influence on the motor cortex, in the same manner as the ganglia of the sensory roots which pass into the lumbar region are centers with relation to the musculature of the leg.

Fig. 15.—Brain of cat with lesion of median part of left crus primum and superior end of left paramedian lobule.

DR. TOM A. WILLIAMS: Why is there no demonstrable difference of tonus in the patient then?

DR. MEYERS: In examining reflexes which are probably the expression of tonus, we find that they are variable. Sometimes they are increased, and cases have been quoted by Gowers in which they have been decreased. So I really think that no definite conclusions can be reached as regards tonus from a study of the reflexes in cerebellar lesions.

New Instruments and Suggestions

A LEG-STRETCHING MACHINE

JOHN RIDLON, M.D., CHICAGO

In November, 1904, I needed a device to stretch the flexion and adduction deformity resulting in a case of hip disease which had been treated by a long traction-splint, and in which the patient had been well for three or four years. There was present a fair range of motion at the joint.

Fig. 1.—Parts of apparatus. From left to right: molded leather anklet with webbing strap which passes to windlass at end of extension rod. Last joint of extension rod with windlass and key for winding. Counterextension post, against which the perineum rests, with socket for ball-joint, clamped to table; into this plug the sacral support and a bayonet-shaped rod for counterpressure. Next comes the first section of the extension rod with ball pivot, and middle sections of extension rod. Beyond these lies the rubber pad which protects the perineum.

A cutting operation into a healed tuberculous joint is attended with considerable risk, and in my opinion is a thing that ought not to be done except from extreme necessity.

A subtrochanteric osteotomy for the correction of the deformity is a perfectly safe procedure, and the operation of choice to correct hip deformities when the joint is ankylosed; but when done on a patient with any considerable range of joint motion, it is usually unsatisfactory because much of the previous deformity usually returns after the operation.

Fig. 2.—Stretching and abducting the limb.

The problem, then, was to devise an apparatus which would make powerful traction on the limb in any direction desired and absolutely maintain it while a plaster cast was being applied.

It was also desired to have a machine which could be taken apart and packed in a small grip to be carried about.

Figure 1 shows the parts of the apparatus.

Figure 2 shows the machine applied to the patient, with rubber pad in place protecting the perineum, and the leg stretched and abducted.

When the muscles have been stretched sufficiently, the hips are raised on the sacral support, counterextension is maintained by the bayonet-shaped piece, and the patient is ready for the plaster cast.

The apparatus may also be used for stretching and straightening contraction deformities at the knee joint, as shown in Figures 4 and 5.

The apparatus, or something of its kind, is absolutely necessary for the proper treatment of fractures of the neck of the femur by traction, abduction and the plaster spica.

Patients with recent fracture of the neck of the femur whom I formerly kept in bed wearing a Thomas hip splint for three or four months may now be safely permitted to rise in from two to four weeks, and there is no pain after

Fig. 3.—Patient ready for application of the plaster cast.

recovery from the anesthetic. This is a matter of no small importance in very old persons.

The apparatus is a necessity for comfortable work when nailing or screwing ancient fractures of the femoral neck; for "setting" fractures of the shaft of the femur, whether recent or when being plated, and for all contraction deformities at the knee, whether operated on or not.

From time to time during the past fourteen years the machine has been modified and additions made to meet new needs.

The present type is shown in Figures 6 and 7.

Fig. 4.—Stretching flexion deformity at the knee.

Two extension rods are now generally used when correcting hip deformities, traction being made on the well side to "balance" and "fix" the pelvis. The sacral support carrying the patient is now raised by a screw device (in the first pattern the patient was lifted by hand). Two polished steel rods make counterpressure, one on each side of the genitals. The ball-and-socket joint is reversed, the ball being attached to the part fastened to the table and the socket being at the proximal end of the extension rod. It gives a more secure joint in the extremes of motion. Pivots are also fastened to

the table on each side of the patient as bases for the traction rods. This adds greatly to the amount of traction that can be had when an adducted limb is to be carried into full abduction. It is obvious that when the extension rod is

Fig. 5.—Patient in position for applying plaster cast to the limb after flexion deformity at the knee has been straightened.

pivoted between the legs, when stretching an adducted limb, the tension is lessened as the limb abducts; but when pivoted at the side of the hip, every degree of abduction into which the limb is swung adds to the traction force by leverage. The leverage of a 5-foot bar is tremendous. It was found that the strongest 1¼ inch surgical webbing, even when doubled, tore apart like wet paper, and we now use rawhide straps in place of the webbing depicted in the illustrations of my first apparatus.

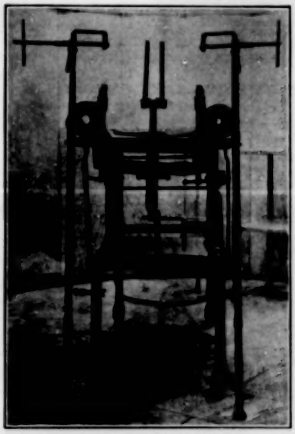


Fig. 6.—Present type of apparatus. Attached to the middle of the end of an ordinary operating table is the pelvic support, which is raised and lowered by a set screw, with upright rods for counter traction, and a ball on which pivots each of the extension rods. On each side of this central piece are two adjustable ball pivots for the extension rods. Outside each of these is the rawhide strap, rolled up, which is looped around the patient's ankle and the ends passed through the windlass at the ends of the extension rods. The extension rods standing on the floor at the corners of the table are jointed for convenience in packing, have a cup at the proxymal end to fit over the ball pivots and allow motion in any direction; and at the distal ends (shown above) are windlasses with keys for making traction through the straps attached to the patient's ankles.

Occasionally one wishes to apply a plaster cast in a case in which a marked lordosis of the lumbar spine is present in a case of flexion at the hip, either from joint disease or from infantile paralysis.

In such cases the flat spade-shaped sacral rest is replaced by two flat bars of annealed steel, bent to the desired curve and supported at their upper ends by a folding sheet-steel pier. The patient is placed on these curved bars, the hip flexed to straighten the spine to the desired extent, and the plaster jacket put on and allowed to set; then the hip deformity is corrected and the cast applied, controlling the position of the hip, knee and foot, if necessary. When such a cast has "set," the counterpressure rods between the legs are unscrewed, the patient lifted up and turned face down, and

Fig. 7.—Present type of apparatus. Same central pelvic rest with the sacral plate removed and two parallel bars of annealed steel, supported at their upper ends by a folding pier. In this form the apparatus is used for supporting the patient while a plaster jacket is applied; or the device shown here and the traction appliances shown in Figure 6 can be used together when putting on a leg-and-body cast for hip and spine disease in the same patient, or in cases of infantile paralysis with spinal and hip deformity.

the flat annealed steel bars drawn out from under the plaster jacket as readily as a saber comes from its sheath.

7 West Madison Street.

CONTINUOUS IRRIGATION FOR WOUNDS

WILBURT C. DAVISON, A.B. (PRINCETON); B.A., B.Sc. (OXON), BROOKLYN

Rhodes Scholar of Merton College, Oxford, from the State of New York; Senior Demy, Magdalen College, Oxford

It has been frequently noted by Wright[1] and others that if a wound or burn is continuously irrigated, it is cleaner, heals more quickly, and the patient does not have the so-called "septic temperature." One of the simplest methods of maintaining continuous irrigation is shown in the accompanying illustrations of patients in a base hospital in England. Figure 1 shows a soldier with a jagged shell wound involving the elbow. His hand and wrist are supported by an overhead suspension. The irrigation is supplied from a reservoir above the head of the bed, and is conducted down to the wound by rubber tubing. The temperature, which was hectic on admission, came down to normal after less than twenty-four hours of irrigation and the wound quickly healed.

It has been found that practically as good results were obtained with irrigations of hypertonic (5 per cent.) saline

1. Wright, Sir A. E.: Proc. Roy. Soc. Med. (London), 1914-1915, Occas Lect., 41; Brit. Med. Jour., 1915, i, 625, 665, 720; Lancet, London, 1915, i, 737, 787, 843, 897.

solution, Vagin's "new antiseptic,"[2] weak iodin, and hydrogen peroxid.

The fluid drips on the highest part of the wound from the rubber tubing (which is cut at an angle), usually at the rate of 30 drops per minute, and flows over the raw surface, draining into a basin or a "rubber basket" suspended below the wound (Fig. 2). This "rubber basket" consists of a wire ring about 14 inches in diameter around which rubber sheeting is loosely attached like a landing net. Into the lowest point of this rubber sheeting there is cemented a piece of rubber tubing which leads into a bucket under the bed. The advantage of this basket is that the wire ring may be bent to fit any wound and thus catch all overflow and prevent its dripping on the bed, as sometimes happens when a basin is used.

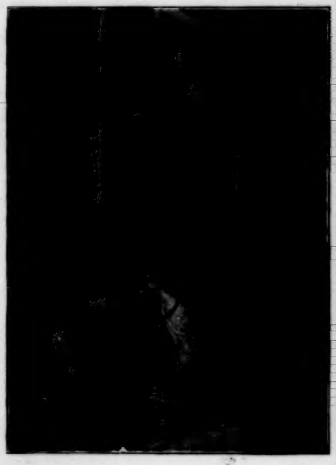


Fig. 1.—Shrapnel wound of arm treated by continuous irrigation (Photograph by Dr. D. P. McDonald.)

Fig. 2.—Rubber basket suspended below the wound to catch the overflow.

29 Seventh Avenue.

A PRACTICAL AUTOMATIC THERMOSTAT FOR THE ARTZBERGER PSYCHROPHORE*

ALVIN E. CERF, PH.C., M.D., SAN FRANCISCO

Heating an instrument for treatment purposes by allowing hot water to flow through it requires the undivided attention of at least one attendant, and presents enough difficulties in exactly regulating and maintaining the required temperature to make this method fairly impracticable and to preclude its successful and general use. About a year ago I devised an automatic thermostat which is simple, practical, fairly inexpensive and obviates all the difficulties attending the regular use of "therapeutic heat" in office and institutional practice and has stood the test of eight months' daily use.

The illustration shows the following parts:

1. Two low voltage heat coils, one a "pilot" coil, *A*, mounted on a wall board, the other placed inside the distal end of the Artzberger psychrophore, *P*. These are of the same resistance, wound with 50 feet of No. 18 chrome resistance wire.

2. A rheostat for regulating voltage, *L*, wound with 150 feet of No. 22 German silver wire, cut in series on one side of the line and having a range of from 1 to 30 volts.

3. Two 32 candle power 110 volt carbon lamps, *M*, *M*, set in series multiple on the other side of the line to give the necessary amperage.

4. An automatic switch for disconnecting the current when the temperature goes above the desired point.

Four disks, *B*, of thin metal, filled with ether, hermetically sealed and held contiguous at their centers.

An upright rod, *D*, which simply rests on the top disk and works freely through the thumb screw, *C*.

A sliding flange, *E*, adjusted on *D* by a set screw, *F*.

The "make and break" arm of the switch, *H*, attached to the cross pin, *G*.

A spiral spring, *I*, which holds *H* in the "make" position at *K*.

The contact point *K*, of the switch.

ACTION

The heat, diffusing from the coil, *A*, vaporizes the ether in *B*, which expands and lifts the disks. This pushes up the rod *D*, causing the flange, *E*, to impinge on the pin, *G*; this presses on and decreases the tension of the spring, *I*, which, when sufficiently pressed, releases the arm, *H*, and accomplishes the "break."

The temperature is regulated by the sliding arm, *O*, of the rheostat. The scale for this should be marked on the rod *R R*. I also have it marked on the board. The flange, *E*, is really a safety valve. I have it firmly screwed on *D*, at a point at which the maximum temperature, which I use therapeutically (120 degrees F.), will break the contact. I never move *E*.

These graduations must be worked out by actual trial. A thermometer is placed in contact with the distal end of the Artzberger psychrophore, and the exact positions of *O* and *E* marked, at which the break occurs, before finally marking each point on the scale *R R*. I allow the thermostat to run three hours at each temperature to make certain there is no variation.

Automatic thermostat for the Artzberger psychrophore.

The instrument requires 2½ amperes at 30 volts.

S, *S* are binding posts for connecting with the house circuit.

T, *T* are binding posts for connecting on the instrument.

2. Smith, J. L.; Drennan, A., and Campbell, W.: Brit. Med. Jour., 1915, ii, 129.

* Presented before the Section of Urology of the San Francisco County Medical Society, Aug. 29, 1916.

ADVANTAGES

My instrument cost $12 for material and $18 for skilled labor. Any degree of heat from 98 to 150 F. can be maintained for any period of time.

No attention is necessary, once the instrument is set and current turned on.

The heating is gradual enough to obviate disagreeable sensations to the patient.

The Artzberger psychrophore may be sterilized by boiling.

The whole outfit is conveniently portable if mounted on a fiber board.

I have long been convinced of the considerable therapeutic value of properly applied heat in the treatment of urethral and prostatic conditions, and hope in the near future to present my experiences for what they are worth.

111 Ellis Street.

MECHANICAL DIFFICULTIES IN ANESTHESIA

A NEW ANESTHETIC MASK

JOSEPH JAROS, M.D., CHICAGO
Instructor in Surgery, Northwestern University Medical School

It occurred to me that a mask so devised as automatically to hold the jaw forward and keep the lips apart would be of great help to the anesthetist. The model shown in the

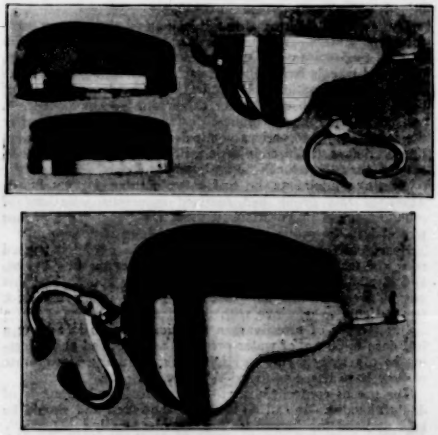


Fig. 1.—Respective parts of mask and the mask assembled.

accompanying illustrations is the result of numerous attempts, and has been used in a large number of cases.

The body is of aluminum, the lower curved margin being rolled inwardly, forming a trough which prevents any excess ether from running down on the face. In front there is a fork which engages with a hooked member, also of aluminum and shaped like tongs. One end of this member is inserted beneath the alveolar process of the mandible and is prevented from slipping out by the other end, which curves beneath the chin. This member may be applied before induction, or at the end of the first stage. With its greatest curve as a fulcrum, the mask rocks on the malar processes. A slight pressure downward on the longer arm of the lever tends to lift forward the shorter arm resting over the chin, and with it the lower jaw. Since the mask is firmly fixed to the mandible, a small band passed over the long arm of the mask fixes it firmly and securely to the face, covering only the nose and mouth, leaving the eyes exposed. The baskets are of light bronze wire mesh, and fit securely into the body of the mask without further fastening. A solid cover may be substituted for this pervious basket in vapor or gas anesthesia.

The committee on anesthesia,[1] reporting to the American Medical Association, said:

A mask which is at once light, easily adjusted, absolutely air tight on any face, quickly removable, and not requiring to be held by the anesthetist is the greatest need.

The mask presented meets these requirements. Made of aluminum, it is light, easily cleaned, easily sterilized and is

Fig. 2.—The mask used with gas or ether vapor.

noncorrodable, it is easily adjusted, and fits any face in subjects over 7 years of age. It can be readily and quickly removed. There is no complicated harness attachment. The ether-saturated portion may simply be lifted off, while the remaining portion of the mask supports the jaw and separates the lips, thus affording ingress of air and permitting ready removal of mucus from the mouth. It is self retaining, a mere band over the upper end of the mask holding it securely and closely. It holds the jaw forward and keeps the lips apart without any appreciable pressure and without any trauma. It is easily prepared by the nurse, no sewing nor clamping being necessary. The gauze in the required number of layers is laid over the smaller basket and covered by the larger one, the protruding portions of the gauze being cut off with scissors. Because the gauze is not folded, the thickness of the mask is exactly uniform. With an opening leading into the body of the mask for the attachment of tubing, it may be used for gas or ether vapor.

Fig. 3.—As used for drop method anesthesia. The inner basket and gauze have been removed in order to show the hook-shaped member resting within the mouth beneath the teeth and lower alveolar process.

It leaves the face and eyes exposed for observation, and proves especially serviceable in operations on the eyes. It eliminates the possibility of ether coming in contact with face or eyes. It can be used with gas or ether, with the drop or insufflation methods.

4515 Greenwood Avenue.

1. Report of Committee on Anesthesia, THE JOURNAL A. M. A., June 15, 1912, p. 1910.

TOXICITY OF THE PRESENT SUPPLY OF SALVARSAN AND NEOSALVARSAN

Oliver S. Ormsby, M.D., and James Herbert Mitchell, M.D., Chicago

During the autumn of 1915, the supply of salvarsan and neosalvarsan in the United States became exhausted. There was none to be had except that in the hands of speculators, who demanded extraordinary prices for the drug.

In the spring of 1916, the agents Farbwerke-Hoechst Company of New York succeeded, after months of effort, in obtaining a shipment from Germany. Shortly after the arrival of this importation, we received a supply of salvarsan direct from the New York agents, and resumed the use of it in the routine treatment of syphilitic patients with the same technic which we had formerly employed.

The water used is distilled in Jena glassware from distilled water furnished by the Consumers' Company. Each morning the water is distilled and collected in Jena flasks of 500 c.c. capacity. The flask is capped with gauze, then put over the flame and kept there until the boiling point is reached, after which it is set aside and allowed to cool. The water remaining after the day's work is redistilled on the following day. The sodium hydroxid solution is prepared in small quantity, at frequent intervals, from chemically pure sodium hydroxid and redistilled water, in a sterile Jena glass Erlenmeyer flask, which is stoppered with rubber. Before the preparation of the salvarsan solution, all the glassware is carefully sterilized and then rinsed with redistilled water. Great care is taken not to add an excess of sodium hydroxid solution in neutralizing the acid salvarsan.

Formerly, we diluted the dissolved and neutralized salvarsan with physiologic sodium chlorid solution, as directed in the instructions. Later, however, we discarded this, and used water in dilutions which represented 0.1 gm. to each 25 c.c.

As soon as we began to use of the new supply of salvarsan, we were immediately struck by the vasomotor phenomena accompanying or following the injection. Within a few seconds after the flow of the solution into the vein had begun, the patient complained of a strong and sickening odor of ether. Marked generalized erythema, and in some cases urticarial wheals, appeared. Lacrimation occurred, followed by injection of the conjunctival vessels. The patient tossed the head from side to side in evident respiratory embarrassment, and complained of a feeling of constriction about the chest. The pulse, at first full, quickly became rapid and weak, accompanied usually by pallor. In a few cases, nausea and vomiting occurred.

June 28, 1916, six patients were given injections of four different ampules, prepared in three separate solutions. The control number on the package was B. B. V. All six reacted as described above in varying degrees of severity. The reactions lasted (and the patients remained in the office under observation) from one hour to three and one-half hours. All had more or less nausea for twenty-four hours following the injection. All but one had had numerous injections previously either of salvarsan, neosalvarsan, or arsenobenzol. Five patients received 0.4 gm., and one patient, his first injection, was given 0.2 gm.

As a result of these reactions, the entire quantity of salvarsan was returned to the New York agents in exchange for other ampules. In this exchange lot, none of the B. B. V. control number was found. The reactions continued with the new lot, although much less frequently; and in an effort to determine whether the vasomotor irritation was due to the method of administration, physiologic sodium chlorid solution was substituted for the water in making the dilution, as advised in the instructions in the package. No diminution of the reaction could be detected as a result of this change. When we informed the New York agents of the reactions we were having, they inquired concerning the sodium hydroxid and water employed, and emphasized the necessity of freshly prepared solutions. These precautions, however, have been routine for years with us.

After the consumption of this supply of salvarsan, its use was discontinued and neosalvarsan was substituted.

In the department of dermatology and syphilis at Central Free Dispensary of Rush Medical College, a group of sixty-three patients was given 127 injections of salvarsan. In this group, there were twenty-eight severe reactions, and a number of mild reactions, consisting of slight nausea, with occasional vomiting, after leaving the dispensary and during the night. The most toxic ampule found was marked B. M. B., and all of the severe reactions occurred with this control mark. The dosage was in all cases 0.4 gm. or less.

The technic used at the dispensary was exactly the same as that described above. Reactions occurred both with the dilutions with physiologic sodium chlorid solution and with the dilutions with water.

The package of the new shipment of neosalvarsan differed from that formerly supplied, in that the individual file was omitted and there was a notice saying that owing to the scarcity of metals it was no longer possible to include more than one file for each five packages. There was no apparent increase, however, in the toxicity of the drug.

The neosalvarsan package is now supplied with a large flat file on which "New York" is stamped. The neosalvarsan in this package is found to be less readily soluble than the former product and tends to form a gelatinous mass when added to the water; as a rule, it becomes necessary to triturate the mass before it goes completely into solution. The present product is also more toxic than the drug contained in the package lacking the file.

The reaction following the injection of the present neosalvarsan differs from that of salvarsan in that there is a marked tendency toward nausea and vomiting. In two cases, urticarial wheals have followed each injection, but the diffuse erythema, lacrimation and respiratory difficulty, with fall of blood pressure, observed after salvarsan, have not occurred.

Five patients have vomited during or immediately after the injection. One patient vomited after each of four injections. Before the first injection (0.3 gm.), this patient had eaten a very light luncheon an hour previously. Prior to the other three injections, he had eaten nothing for six hours. Three of this group had received numerous injections of other arsenical preparations without reactions. One patient was also in the group of six reactions, June 28.

Nearly all of the patients now complain of the increased odor and taste which occur immediately after the flow begins, and in some cases continue for twenty-four hours. For this reason, we have had considerable difficulty in persuading a few patients to continue with the injections.

Our technic of neosalvarsan injection consists in adding a full dose to 30 c.c. of water prepared as described and injecting by a gravity method. Higher dilution and a slower rate of flow have not diminished the reaction.

The use of epinephrin, as first advocated by Milian,[1] is of doubtful value. It can do no harm, however, and should be kept at hand for immediate use hypodermically.

CONCLUSIONS

1. The striking increase in the number of severe reactions following the use of salvarsan as now supplied indicates a high degree of toxicity.
2. That neosalvarsan, too, is more toxic than formerly is indicated by the number of cases in which immediate vomiting occurs.

25 East Washington Street.

1. Milian: Bull. Soc. franç. de dermat. et de syph., 1914, p. 104.

Method of Combating Infections.—Attention is being directed more and more to the foci from which infection spreads, rather than to the route by which it may be disseminated. The present teaching is that the control of communicable diseases can best and most reasonably be effected by taking charge of and destroying the infective organisms at the moment they leave the patient. They should not be given an opportunity to reach other individuals in such a state of virulence that they may cause disease in such individuals.—W. H. Hattie, M.D., *Public Health Journal*, September, 1915.

SYMPTOMS FOLLOWING INJECTION OF NEOSALVARSAN

A. M. MOODY, M.D., CHICAGO

For some time intravenous injections of salvarsan and neosalvarsan have been given with scarcely any ill effects. More recently, however, the results following injections, especially with the present available product of neosalvarsan, but occasionally also with salvarsan, have been such as at times to keep the patient somewhat worried. This condition is of a transitory nature, although slight symptoms may occasionally persist for a few days.

In several cases, chills with headache, nausea, diarrhea, and in some instances vomiting have followed a single injection of neosalvarsan. The onset of these symptoms may be immediate or delayed from one to twelve or more hours. In few instances have the symptoms persisted for any length of time. Another disagreeable symptom which I have seen twice is a feeling that one is going to choke. This seems to carry with it a large element of fear, which rapidly disappears in from fifteen to thirty minutes. Physically it has been impossible to detect any anatomic alterations during such attacks. The symptoms are purely subjective. Sneezing is another phenomenon occasionally seen.

We have records of only one death following intravenous injection of neosalvarsan. This patient, a woman, was injected Thursday at 3 p. m., receiving 0.9 gm. of neosalvarsan. The patient was in poor condition when the injection was made, she later developed headache, chills and backache, Friday night went into coma, and died at 10 a. m. Sunday, with what the physician described as symptoms of arsenical poisoning. These findings were not confirmed by postmortem examination.

It is our custom to give the salvarsan and neosalvarsan by the gravity method, in quantities of solution varying from 100 to 150 c.c. All solutions used are made up daily with freshly double distilled water. The water is distilled over glass. These precautions we believe are absolutely essential to avoid the more violent reactions which so frequently follow the giving of such substances in small bulk and rapidly, as usually occur following the intravenous administration by syringe.

We have also observed that those persons who have had a meal just prior to receiving the injection are the ones who almost invariably have some toxic symptoms.

About 2,000 doses of arsenobenzol—Schamberg's preparation—have been given here without any of the toxic results seen following the use of neosalvarsan and salvarsan. Unfortunately the manufacture of this product has been discontinued.

TOXICITY OF SALVARSAN

JOHN D. ELLIS, M.D., CHICAGO

In the great majority of cases in which I have used the salvarsan purchased during the last three months, I have noticed some toxic symptoms. Fully half of these patients have suffered from repeated vomiting after an intravenous injection. Intravenous injections of salvarsan purchased prior to that time rarely resulted in vomiting or any toxic symptoms.

In one case, in a man, aged 22, who came to the office with a chancre of three days' duration, but with a positive Wassermann reaction, I administered 0.6 gm. neutralized in 180 c.c. of freshly distilled water. No symptoms occurred until three hours after injection, when the patient had an attack of vomiting lasting three or four minutes, with retching and severe nausea continuing for about an hour. For six days thereafter his nausea was relieved only on his assuming a supine position. He was unable to retain anything in the stomach, even water being promptly vomited. Any attempt to rise was followed by severe nausea and vomiting. Emesis for the first day consisted of bile-stained mucus. Enemas were administered, and proctoclysis was done. The urine became highly acid, but no casts, albumin or blood appeared. The blood pressure ran from 105 to 115 systolic; the white blood count was 8,500. Physical examination revealed nothing except considerable tenderness over the liver, which, however, was not enlarged, and some slight tenderness over the epigastrium. There was no rigidity determined.

One week after the patient recovered from this attack I administered 0.4 gm. of salvarsan intravenously in 100 c.c. of water, and this was followed by attacks of vomiting and nausea lasting two days. At the end of this time the patient recovered, and I have been unable to detect any injury to the kidneys since that time.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 1673)

TECHNIC OF PHENOLSULPHONEPHTHALEIN TEST

Aseptic ampules prepared for subcutaneous injection can be obtained,* each ampule containing 1 c.c. of sterile salt solution and 0.006 gm. of phenolsulphonephthalein. Half an hour before the injection the patient should be given 250 c.c. of water to insure that urinary secretion will not be delayed on account of a shortage of water. Next, the patient is catheterized under aseptic precautions, or he empties his own bladder. Then the phenolsulphonephthalein is given subcutaneously or intramuscularly, or rarely intravenously. When it is given subcutaneously or intramuscularly, the patient should urinate at the end of the first hour and again at the end of the second hour, into different receptacles; or if a catheter is in the bladder, the urine may drip into a test tube containing a drop of a 25 per cent. solution of sodium hydroxid, and the first slight pink color should be noted and the time recorded. The catheter is then clamped and the urine drawn at the end of the first hour, and again at the end of the second hour. Each sample of urine should be measured and tested for its specific gravity; then enough of a 25 per cent. solution of sodium hydroxid is added to the urine to make the color which in acid urine is yellow or orange change to the deepest possible reddish purple. This solution is diluted with distilled water to 1,000 c.c., and the whole thoroughly mixed. A small portion is filtered and placed in a color test glass for comparison with some standard or colorimeter, of which several types may be obtained.

It should be noted that the phenolsulphonephthalein may be freely excreted though but a small amount of urine is passed, that is, the amount of urine passed has no relation to the amount of phenolsulphonephthalein excreted. Normally, on the average, 50 per cent. should be recovered in the first hour, and 85 per cent. at the end of two hours, from intramuscular injections. From intravenous injections, from 35 to 45 per cent. should be recovered the first fifteen minutes, from 50 to 65 per cent. in thirty minutes, and from 65 to 85 per cent. in one hour. If in two hours, when it is given intramuscularly, only 40 per cent. or less of the phenolsulphonephthalein has been excreted, Elliott[9] considers that not only are the kidneys defective, but also there is a retention of waste nitrogen in the blood, and a blood test should be made.

To note just when the elimination of phenolsulphonephthalein ceases, the patient may pass the urine every hour for six hours.

* See New and Nonofficial Remedies, 1916, p. 247.

9. Elliott, A. R.: The Phenolsulphonephthalein Test in Chronic Nephritis, THE JOURNAL A. M. A., June 5, 1915, p. 1885.

OTHER TESTS OF FUNCTION

In the iodid test of von Noorden,[10] a capsule containing 0.2 gm. of potassium iodid is given on an empty stomach, swallowed with 50 c.c. of water. The saliva is tested for iodin every three minutes to show when the capsule dissolves, and the urine is drawn and tested every five minutes. Normally the saliva shows iodin in from eight to twelve minutes, and the urine shows it from three to five minutes later. If the reaction in the urine is delayed half an hour, it is a moderate delay; if it is delayed from this time to one hour, the delay becomes more and more significant. All the iodin should be eliminated in thirty hours.

Thomas[11] urges the use of indigocarmin as a valuable indication of the functional capacity of each kidney, as evidenced by the output of colored urine at each ureter during ureteroscopy. He finds it valuable in all surgical conditions, and especially valuable in conjunction with roentgenoscopy in the diagnosis of renal calculi. After the patient is prepared, according to the technic which he describes, 20 c.c. of a 0.4 per cent. solution of indigocarmin are injected into the gluteal muscles, and if the kidneys are normal, they will excrete a dark blue liquid in from three to twenty minutes and a light blue in fifteen minutes. In his 200 tests it appeared as light or dark blue in fifteen minutes in 90 per cent. of the cases, and in ten minutes in 61 per cent. of the cases. If the indigo does not appear as light blue in fifteen minutes or as dark blue in twenty minutes, there is a serious insufficiency of renal function. Of course the ureteroscope will show in surgical conditions a more or less marked discrepancy in the excretion from the two kidneys.

In a later article, Thomas[12] emphasizes his belief that his low mortality in prostatectomy (3.3 per cent.) is due to the previous indigocarmin test and a recognition of operative limitations. Although this test to decide the difference between a surgical kidney and its fellow is of value, as described by Thomas, it is not as good a test of renal gland function as is the phenolsulphonephthalein test, as only 25 per cent. of indigocarmin is excreted by the kidneys. Furthermore, indigocarmin excretion may not be decreased in some instances of acute or diffuse nephritis, and a blue color may not develop in purulent and alkalized urines.[13]

The methylene blue test is not as good as the phenolsulphonephthalein test, and has the same defects as the indigocarmin.[14]

Neubauer[15] gives 1.5 gm. of creatinin in 150 c.c. of sweetened water, and finds that healthy kidneys eliminate from 60 to 90 per cent. of it in six hours and the remainder in six more hours. With diseased kidneys less than 20 per cent. is eliminated in six hours, and the rest not in days. While in nephritics lactose excretion is always delayed, with serious congestion of the kidneys, its excretion does not follow the rate of phenolsulphonephthalein excretion and does not show what part of the kidneys is affected.[14]

In a recent article, Mosenthal and Lewis[16] state that too much reliance must not be placed on single tests of renal function, as kidneys may retain sodium chlorid, urea, phosphates, sulphates, or even water — any one of these substances — and yet allow the remaining substances to be excreted. They place great value on the test meal for kidney function, on phenolsulphonephthalein, and on Ambard's formula.[17] After a study of the subject, however, Jonas and Austin[18] conclude that the estimation of the blood urea is more reliable and more useful than is the urea index or the Ambard quotient.

DETERMINATION OF THE NITROGEN OF THE BLOOD

The examination of the blood for the total nonprotein nitrogen and for urea, together with the tests of the kidney excretion described above, has advanced the understanding of kidney defects, and presages the limitations of medical and surgical treatment of genitourinary disease. The method of Folin,[19] in which from 2 to 5 c.c. of blood are required, is probably the test most used.

Nonprotein nitrogen is a term applied to the nitrogen remaining after all proteins have been precipitated out of the blood. Such remaining nitrogen is also termed "incoagulable nitrogen" and "retention nitrogen."

In the beginning it should be urged that a single determination of the nonprotein nitrogen of the blood is not conclusive, unless the amount is large, but a progressive increase from day to day or week to week shows danger of uremia, and uremia is not a condition caused by one poison, but by many.

Tileston and Comfort[20] believe that the nonprotein nitrogen of the blood below 30 mg. per hundred c.c. of blood is normal; from 30 to 35 mg. it shows a slight increase; from 35 to 50 mg. a considerable increase, and from 50 to 100 mg. a great increase. Nonprotein nitrogen of 100 mg. or more is of very serious prognosis. More than 16 mg. of urea per hundred c.c. of blood is abnormal, and more than 25 mg. shows a considerable increase. This agrees closely with the figures offered by Bang[21] of Sweden, who says that 25 mg. of nonprotein nitrogen in 100 gm. of blood is normal, and about 15 mg. of this should be urea. More recently Gettler and Baker[22] have examined the blood in thirty normal individuals three hours after a uniform breakfast, and find the nonprotein nitrogen higher than the foregoing figures, namely, from 30 to 45 mg., and the urea from 15 to 25 mg.

Tileston and Comfort found that the determination of the total nonprotein nitrogen was more important than the urea determination. They found in chronic interstitial nephritis the nonprotein nitrogen increased even to 324 mg. per hundred c.c. of blood, and the urea even to as much as 237 mg. Sometimes, however, there may be a normal nonprotein nitrogen in some forms of chronic nephritis.[23]

During acute disease, as pneumonia, there may be a retention of nitrogen in the blood, and such a condition is probably a frequent added cause of death in this most serious of acute diseases.

While uremic patients practically always show nitrogen retention, it is interesting to note that puerperal

10. Von Noorden: Med. Klin., 1916, xii, No. 1.
11. Thomas, B. A.: The Results of Two Hundred Chromo-Ureteroscopies Employing Indigocarmin as a Functional Kidney Test, THE JOURNAL A. M. A., Jan. 18, 1913, p. 185.
12. Thomas, B. A.: The Rôle of Functional Kidney Tests and Preoperative and Postoperative Treatment in the Reduction of Prostatectomy Mortality, THE JOURNAL A. M. A., Nov. 28, 1914, p. 1909.
13. Hepburn: Yale Med. Jour., March, 1912, p. 289.
14. Potter and Bell: Am. Jour. Med. Sc., February, 1915, p. 236.
15. Neubauer: München. med. Wchnschr., 1914, lxi, No. 16.
16. Mosenthal, H. O., and Lewis, D. S.: A Comparative Study of Tests for Renal Function, THE JOURNAL A. M. A., Sept. 23, 1916, p. 933.
17. McLean: Jour. Exper. Med., 1915, xxii, 212.
18. Jonas, Leon, and Austin, J. H.: Am. Jour. Med. Sc., October, 1916, p. 560.
19. Folin, Otto: Jour. Biol. Chem., 1912, xi, 527.
20. Tileston, Wilder, and Comfort, C. W., Jr.: The Total Non-Protein Nitrogen and the Urea of the Blood in Health and in Disease, as Estimated by Folin's Methods, Arch. Int. Med., November, 1914, p. 629.
21. Bang: Biochem. Ztschr., 1915, lxxii.
22. Gettler and Baker: Jour. Biol. Chem., 1916, xxv, 211.
23. Frothingham, Channing, and Smillie, W. G.: The Relation Between the Phenolsulphonephthalein Excretion in the Urine and the Non-Protein Nitrogen Content of the Blood in Human Cases, Arch. Int. Med., October, 1914, p. 541.

eclampsia does not always, and perhaps seldom, show such retention, unless there has been a long previous nephritis. In other words, puerperal eclampsia may or may not be a true uremia, as other retained intoxicants may cause convulsions besides those retained by kidney insufficiency.

The diet of a nephritic should be modified by the amount of nonprotein nitrogen of the blood. Surgical operations should be postponed if practical when the blood shows an increased amount of nonprotein nitrogen.

As syphilis is now known to attack the kidneys more frequently than was supposed, and as retained nitrogen may be in evidence in this disease, the effect on the kidneys of arsenic and mercury treatment in these patients must be seriously considered. Whether or not the arsenic treatment predisposes to kidney disturbance later in syphilis should also be investigated. Acute intestinal obstruction has been shown to increase the blood nitrogen, and the same may be true of many acute painful or serious crises.

Ordinarily, but not always, in nephritis, the less the phenolsulphonephthalein output, the greater the amount of nonprotein nitrogen in the urine. According to Frothingham and Smillie, and others, passive congestion of the kidneys from cardiac insufficiency may markedly diminish the output of phenolsulphonephthalein without an increase of the nonprotein nitrogen being found in the blood.

As shown by Hopkins and Jonas,[24] the amount of protein fed a chronic nephritis patient has a direct bearing on the amount of nitrogen retention, and therefore a frequent estimate of the nonprotein nitrogen of the blood has a distinct therapeutic value. Many nephritic patients are unnecessarily underfed. Mosenthal and Richards[25] came to the conclusion, after careful investigation in nephritic patients, that even when there was a retention of nitrogen in the body, as determined by the protein intake and the nitrogen output, there was not necessarily an increase in the nonprotein nitrogen of the blood. Hence at times in nephritics a normal protein nonprotein nitrogen in the blood may not show that nitrogen is not retained.

Cameron[26] says that after a general anesthetic there is usually an increase in the urea of the blood, and this is especially true in operations on the genitourinary tract, and of course most frequently in patients who have a diminished kidney function.

Schwartz and McGill[27] give their findings after estimating the urea of the blood in 211 patients as follows: The urea of the blood is greatly modified by diet; is increased by nephritis, varying with the degree of inflammation and congestion; is increased by mechanical obstruction of the urinary tract; is generally increased in pneumonia; is increased in exophthalmic goiter; is decreased in myxedema, and in many acute conditions and infections it is increased.

Addis and Watanabe[28] state that the rate of excretion of urea by the urine varies with the urea concentration in the blood.

It was long in vogue to give large amounts of water in nephritis "to wash out the kidneys." More recently it was shown that this was bad in dropsy, in which the kidneys do not excrete water well. We must now come to the intermediate decision, namely, that with nitrogen retention and with damaged kidneys which cannot excrete a concentrated urine, and when there is no great amount of edema, we must give considerable water at the same time that we diminish the protein intake in order to eliminate the solids and retained nitrogen. The truth of this statement has recently been demonstrated by Foster and Davis.[29]

(To be continued)

24. Hopkins, A. H., and Jonas, Leon: Studies in Renal Function with Special Reference to Non-Protein Nitrogen and Sugar Concentration in the Blood, Phenolsulphonephthalein Elimination and Blood Pressure, Arch. Int. Med., June, 1915, p. 964.
25. Mosenthal, H. O., and Richards, A. E.: Interpretation of Positive Nitrogen Balance in Nephritis, Arch. Int. Med., February, 1916, p. 329.
26. Cameron, D. F.: Variations in Renal Function Dependent on Surgical Procedures, THE JOURNAL A. M. A., June 3, 1916, p. 1765.
27. Schwartz, Harold, and McGill, Caroline: Blood Urea Determinations in 211 Cases, Arch. Int. Med., January, 1916, p. 42.
28. Addis and Watanabe: Jour. Biol. Chem., March, 1916, p. 1057.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

MERCURIALIZED SERUM-MULFORD (See N. N. R., 1916, p. 192).

The following dosage forms have been accepted:

Mercurialized Serum-Mulford, No. 5-A.—Each package contains one 8 Cc. graduated sterile glass syringe with sterile needle, containing the equivalent of 0.0055 Gm. (1/12 grain) mercuric chloride.

Mercurialized Serum-Mulford, No. 5-B.—Each package contains one 8 Cc. graduated sterile glass syringe with sterile needle, containing the equivalent of 0.011 Gm. (1/6 grain) mercuric chloride.

Mercurialized Serum-Mulford, No. 6-A.—Each package contains ten 8 Cc. graduated sterile glass syringes with sterile needle, each containing the equivalent of 0.0055 Gm. (1/12 grain) mercuric chloride.

Mercurialized Serum-Mulford, No. 6-B.—Each package contains ten 8 Cc. graduated sterile glass syringes with sterile needle, each containing the equivalent of 0.011 Gm. (1/6 grain) mercuric chloride.

29. Foster and Davis: Am. Jour. Med. Sc., January, 1916, p. 44.

Who Shall Survive?—The eugenist who tries more than to eliminate the unfit will first of all be called on to answer the question what strains are the best to cultivate. If it is a question of breeding Indian corn or chickens, we know what we want. We desire a large yield of good corn, or many eggs of heavy weight. But what do we want in man? Is it physical excellence, mental ability, creative power, or artistic genius? We must select certain ideals that we want to raise. Considering then the fundamental differences in ideals of distinct types of civilization, have we a right to give to our modern ideals the stamp of finality, and suppress what does not fit into our life? There is little doubt that we, at the present time, give much less weight to beauty than to logic. Shall we then try to raise a generation of logical thinkers, suppress those whose emotional life is vigorous, and try to bring it about that reason shall reign supreme, and that human activities shall be performed with clocklike precision? The precise cultural forms that would develop can, of course, not be foretold, because they are culturally, not biologically, determined; but there is little doubt that within certain limits the intensity of emotional life—regardless of its form—and the vigor of logical thought—regardless of its contents—could be increased or decreased by organic selection. Such a deliberate selection of qualities which would modify the character of nations implies an overestimation of the standards that we have reached, which to my mind appears intolerable. Personally the logical thinker may be most congenial to me, nevertheless I respect the sacred ideals of the dreamer who lives in a world of musical tones, and whose creative power is to me a marvel that surpasses understanding.—Franz Boas.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

Contributors, subscribers and readers will find important information on the second advertising page following the reading matter

SATURDAY, DECEMBER 9, 1916

BACTERIA ON PAPER MONEY AND BOOKS

Since bacteriology demonstrated the widespread distribution of bacteria and emphasized the almost omnipresent opportunity for the transmission of disease in this way, the fear of micro-organisms has become almost an obsession with many persons. Appreciation of the unseen dangers which constantly lurk about us has done much to initiate manifold performances in the interest of hygiene. Public and personal sanitation can be enforced effectively in a free country only when its dictates are in accord with the education of the persons involved. Cooperation means so much in the carrying out of hygienic reforms that all workers in the domain of the public health have begun to realize the real value of popular education in this field. Public opinion is today respected as a potent factor in hygiene as well as in politics and the management of social problems.

Popular reaction is recognized as harmful when it initiates a spirit of distrust. Many of the hasty generalizations of science, and, above all, many of the unwarranted assertions which continually appear in print under the guise of scientific or pseudoscientific authority sooner or later redound to the discredit of real progress. An attitude of skepticism is awakened, and the distrust of an obvious misstatement unconsciously becomes magnified into a reactionary indifference to the better contributions of scientific men. It is important, therefore, that workers in the world of science should guard against the public propagation of any doctrine which does not rest on sufficiently substantial evidence to justify the propaganda. The championship of half truths or conjectured truths inevitably acts in the course of time as a barrier to the very objects which are sought in public reforms; for in the end, truth always prevails.

In illustration, the popular opinion of a few years ago in respect to soiled paper money may be cited. Even today it is regarded by many as extremely dangerous to handle, and many people still insist on clean bills when they are getting change. Bank tellers rarely exhibit such aversion, nor do they give a history of exceptional incidence of infectious disease. Our currency has been blamed for the spread of disease and death, especially when it has been difficult to find the true etiologic agency. We recall that not long ago a case of myxedema was regarded by a daily newspaper as the outcome of counting money — a conclusion which will certainly surprise those who have placed the disease in a category quite independent of the infections.

Because of such apparently exaggerated contentions, an actual investigation of the bacteria present on soiled money was made by Hilditch,[1] who arrived at the conclusion that money constitutes an unimportant factor in the transmission of disease. We want and certainly need a more frequent redemption of our soiled and worn bills, yet the facts and evidences at hand do not justify us in alarming the public needlessly by rash statements concerning our currency. Such seemingly conservative deductions do not in any way negative the the possibility that money, like other things, may at times act as a medium of disease transmission.

The experience gained in the bacteriologic study of soiled paper money has been repeated in the case of books, which have likewise been looked on frequently as dangerous factors in the dissemination of the contagious diseases. Let it be clearly stated at the outset that books which have been handled by persons suffering from one of the communicable diseases should always be disinfected before they are used again. No one will gainsay this. Is there justification, however, for the suspicion with which the books in public libraries are so often regarded? Exposure to sunshine and air, and disinfection can be enforced as a routine measure if necessary; but books are not immune to the inevitable damage resulting from such usage. Recently Laubach,[2] of the laboratory of hygiene and bacteriology at Johns Hopkins, has examined bacteriologically a large number of badly soiled and torn books in constant circulation for several years among Baltimore children in whose homes the sanitary conditions were decidedly unsatisfactory. The majority of bacteria found on books belonged to the chromogenic group, corresponding to the species found in atmospheric air. They were in general somewhat attenuated. Although the colon bacillus has been demonstrated to occur on the hands of schoolchildren,[3] the relative infrequency of this organism on soiled books would seem to indicate that it does not find on books the proper conditions for multiplication. This factor is too frequently lost sight of in the current conceptions of bacterial life. In pure water, for example, most bacteria soon die. In no instance could the diphtheria bacillus be isolated from books, although it was known that some of the Baltimore books, in the lots examined, had come from homes in which children were suffering from the

1. Hilditch, W. W.: A Bacteriological Study of Soiled Paper Money, Pop. Sc. Month., August, 1908, p. 157.
2. Laubach, C. A.: The Possible Rôle of Books in the Dissemination of Contagious Diseases, Johns Hopkins Hosp. Bull., 1916, xxvii, 183.
3. Winslow, C.-E. A.: The Occurrence of the Colon Bacillus on the Hand, Jour. Med. Research, 1903, x, 463.

disease. Kenwood and Dove[4] have reached the conclusion from similar investigations that "there is probably no material risk involved in the reissue of books recently read by consumptives, unless the books are obviously soiled. Even then the risks are very slight."

As a practical outcome of the recent studies in the bacteriology of books it appears, in accord with Laubach's findings,[2] that pathogenic bacteria can seldom be isolated from books which have been handled by sick patients, and there is, therefore, no empiric reason for maintaining that books serve as vehicles of infection. Direct sunlight and diffuse daylight are the most efficient germicides for organisms found in books, as they are for the same organisms under other conditions. Since, however, pathogenic bacteria, like the typhoid bacillus and diphtheria organism, can be recovered from artificially infected books under various circumstances after long periods of time, and since the diphtheria bacillus does not lose in virulence during this period, there are sufficient reasons for insisting on the thorough disinfection of books which have been handled by patients.

THE IRRITABILITY OF THE STOMACH

The heart is developed from a muscular tube in which there is assumed to be muscular continuity throughout. Although the primitive vertebrate heart is formed by a modification of this tube, the musculature of the chambers is continuous throughout. In the adult heart of man the anatomic relations of the different cavities have become considerably modified in the course of development. The sinus venosus of the lower forms is now represented merely by a bit of specialized tissue at the termination of the coronary sinus in the right auricle and of the superior vena cava where it serves as the "pace maker" of the heart beat. The two accumulations of more primitive tissue known as the sino-auricular node and the auriculoventricular node play an important rôle in the functions of the cardiac tissue as an organ.

The stomach may also be studied from the point of view that it has evolved from a simple tube much as the heart has been enlarged and specialized. Reasoning from the grounds of comparative anatomy and embryology, Alvarez[5] maintains that we should expect to find the remnants of the primitive intestinal tube along the lesser curvature. These theoretical considerations led to the discovery that strips of muscle from different parts of the stomach wall vary markedly in their tendencies to rhythmic activity, in the rates of contraction, and in the forms of the curves. The most rhythmic region was found on the lesser curvature next to the cardia. The rate of contraction was generally faster and the rhythm more regular in the strips from the lesser curvature than in those from the greater curvature.

According to the most recent observations of Alvarez at the George William Hooper Foundation for Medical Research at the University of California Medical School, the developmental peculiarities of the stomach correspond with differences in the irritability and latent period associated with the differences in contractility. Thus in some of the laboratory animals the latent period for faradic, galvanic and mechanical stimuli is shortest around the cardia and along the lesser curvature as far as the incisura angularis. These limits include also the most irritable part of the stomach. The region of the greater curvature and fundus is much less irritable and often fails to react at all. The pyloric ring is more irritable and reacts more promptly than does the rest of the antrum. The duodenum is much more irritable than the pyloric antrum. The posterior surface of the stomach is a little less irritable than the anterior surface, and the latent periods are longer. With the exception of the cardia and lesser curvature, the stomach in situ is often quite refractory to stimulation in its cardiac half. This seems to be due to nervous inhibition as it is marked in the excised stomach, and less marked in strips of muscle cut from the fundus or greater curvature. It seems likely that the nervous mechanism serves more to restrain the muscle — to keep it from reacting to every stimulus — than to render it more irritable.

A few experiments performed by Alvarez on human stomachs suggest that the findings on the other species will be confirmed in the case of man. He also announces his agreement with Meltzer that it is quite hopeless to attempt to influence the stomach therapeutically by intragastric or abdominal electricity. The refractoriness of the stomach in situ, particularly when stimulated through the mucous membrane, is so great that even powerful currents will produce no motor effect.

SOME HYPOTHESES CONCERNING VARIATIONS IN THE CONTENT OF BLOOD SUGAR

The widespread interest which has been manifested recently with respect to the concentration of the sugar in the blood has naturally prompted hypotheses in relation to its significance and to the cause of the variations that may occur. The pathologic variations, such as the marked increases in the blood sugar content found in diabetes or renal impairment, need not be considered here. Even under admittedly physiologic conditions detectable alterations in the sugar content may arise as the result of either the dietary or bodily incidents. What do they signify?

The ingestion of sugar or other carbohydrates leads to a rise in the blood sugar in man. The extent of this increase now appears to be variable to such a degree

4. Kenwood, H., and Dove, E.: The Risks from Tuberculous Infection Retained in Books, Lancet, London, 1915, ii, 66.
5. Alvarez, W. C.: Am. Jour. Physiol., 1916, xl, 585; Differences in Irritability and Latent Period in Different Parts of the Wall of the Stomach, Am. Jour. Physiol., 1916, xli, 321.

as to raise the question whether the response of the individual in apparent health is likely to be the same under different conditions. Graham[1] has lately reported from the laboratories of St. Bartholomew's Hospital, London, new data which have the unusual value of being obtained from a single person at many intervals over a long period of time. In confirmation of earlier observations they show the change in the blood sugar after a carbohydrate meal; but they also suggest that the height to which the level of the blood sugar rises varies with the general condition of the individual and the rise which occurs during fatigue may be pathologic. According to Graham a dose of 100 gm. of glucose produces a sudden rise in the blood sugar in adult men which may be apparent within ten minutes and usually reaches the maximum in twenty minutes. The sugar usually reaches its original level in from one to one and one-half hours. Under conditions which cause fatigue, the blood sugar rises to a greater height and takes from three to four hours to fall to its original level.

The rapidity with which the absorption of the sugar from the intestines proceeds and with which the level of the blood sugar rises are rather startling, and the short duration of the rise in healthy adults is equally astonishing. One of the hypotheses regarding the handling of the sugar absorbed from the bowel postulates that it is promptly taken up from the portal circulation by the liver in which it becomes deposited as glycogen. Following this it has been assumed that the rise in blood sugar observed after a meal may be due to a failure of the liver to take up all the sugar from the portal vein when it arrives with a sudden rush after a heavy carbohydrate meal. Graham replies to this by remarking that when it is considered that this rise in the blood sugar takes place two to three times a day in healthy people it seems most unlikely that the liver should be caught napping each time and allow some sugar to escape into the general circulation. Hence it seems probable that the "extra" sugar is either going to be used at once or is on its way to another storehouse. Some sugar is certainly used at once, as the respiratory quotient rises soon after a meal; but the greater part of it must either be stored in the muscles, liver, etc., or be laid down as fat.

If it proves to be true that the normal rise in blood sugar after a meal is not due to a failure on the part of the liver to take up the sugar, but that the "extra" sugar is on its way to the muscles and other storehouses, the rise which Graham finds taking place in fatigue might be due to a slight diminution in the power of the muscles and other depositories to take up sugar as quickly as usual. Consequently in fatigue there is more sugar circulating in the blood than usual and the time taken by the tissues to take up the sugar is longer than usual. Graham believes that this condition is very suggestive of the early stages of the alimentary glycosuria which occurs in elderly people. In these patients sugar is passed very soon after a carbohydrate meal and is accompanied by a marked rise in the blood sugar. It seems probable to him therefore that this form of glycosuria is also due to a failure on the part of the tissues as it takes place so soon after meals.

These views relating to blood sugar in fatigue are not easily harmonized with the widely accepted hypothesis of Cannon.[2] If we may associate fatigue with the results of struggle, according to Cannon the increased concentration of sugar in the blood of animals during intense emotions, together with the mechanism by which the increase is brought about, may be considered as a physiologic adaptation. According to this idea the increased amount of sugar that frequently is present in the blood during an emotion is for the purpose of supplying the muscles with the increased energy required for the physical activity necessitated by the emotion. Cannon has interpreted such excess of sugar as the result of an excessive secretion of the suprarenal glands. The organism, he remarks, which with the aid of increased suprarenal secretion can best muster its energies, call forth sugar to supply the laboring muscles, lessen fatigue, and send blood to the parts essential in the run or the fight for life, is most likely to survive.[3]

To the conflicting views which look on a higher blood sugar content in fatigue either as evidence of inadequate storage capacity on the part of overtaxed tissues or as indication of overmobilization of carbohydrate to assist in the work antecedent to the fatigue, further complications may be added through the researches of Lee and Scott,[4] who have reported a decreased concentration of sugar in the blood as the effect of the depressing atmospheric conditions represented by high temperature and humidity. They suggest that if there is a physiologic adaptation of the fuel supplied to the increased amount of work to be done, it seems not unreasonable to believe that the reverse may also be true. In other words, when it is physiologically fitting that the animal reduce muscular exertion to a minimum, in order that the output of heat may be as low as possible, as in a hot and humid environment, the supply of fuel will be lowered correspondingly. The assumption that less sugar is mobilized in response to a lessened heat requirement of the organism adds another to the varied hypotheses as to the causes of alterations in the content of blood sugar from time to time in a reasonably normal individual, thus serving as a reminder that the last word on this subject has yet to be pronounced.

1. Graham, G.: Variations in the Blood Sugar in Health, Jour. Physiol., 1916, l, 285.

2. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage, New York, 1915.

3. Cannon, W. B.: The Emergency Function of the Adrenal Medulla in Pain and the Major Emotions, Am. Jour. Physiol., 1914, xxxiii, 372.

4. Lee, F. S., and Scott, E. L.: The Action of Temperature and Humidity on the Working Power of Muscles and on the Sugar of the Blood, Am. Jour. Physiol., 1916, xl, 486.

CHICAGO'S DIETETIC EXHIBITION

In H. G. Wells' fantastic story entitled "The Food of the Gods," one of the characters discusses the supposed eccentricities of the chemist and the physiologist, who are represented to be engaged in the practical investigation of this great boon to the world. He adds: "And that you will find the case with 'scientists' all the world over. What there is great of them is an annoyance to their fellow scientists and a mystery to the general public, and what is not is evident." Had this burlesque of the men of science been written during the past few days, one might well have concluded that its author was thinking of the widely heralded "diet squad" which has lately given Chicago a prominent place on the front pages of the daily papers. One of these,[1] for example, quotes the "health authority" as saying: "If you are paying more than 40 cents a day for your food you are wasting your money. . . . This [health] department believes it is not going beyond its proper province in tackling the proposition of showing the Chicago public what it believes the best method of overcoming the difficulty." A group of twelve volunteers is accordingly enlisted to partake of selected menus which must not cost more than 40 cents a day for each person, "in the hope that housewives may learn how to serve better meals more cheaply." The criterion of adequate nutrition is stated to have been the body weights of the subjects.

So far as such a program is an attempt at popular education in the planning of meals, marketing, etc., it belongs in the sphere of home economics and household arts, and concerns the medical man only indirectly. But the activities of a bureau of health are of more direct interest to the physician. He quite naturally asks what factor of health conservation is involved in this propaganda, what novelty it introduces, and how valid are the methods employed and the deductions made.

Certainly there is nothing unique in the purchase of adequate nutrition at 40 cents per day per person, even in these "war times." It is a familiar theorem that a family ought not to spend more than half of its income for food. On the basis of the 40-cent figure just quoted, the average workingman's family of five would pay two dollars a day for its rations, postulating an income of about $120 a month; yet many a family lives on an income of half that amount. There are many data available to show that in the conventional family of two adults and three children an average of 25 cents per day per person can be made to nourish them. Such provision obviously does not permit elaborate menus; but when it is contrasted with the 40-cent figure, supposedly an unusually restricted allowance by the very fact that the "test" has been undertaken at this low price level, the "problem" loses all elements of uniqueness.

1. City Diet Squad Planned in War on Living Cost, Chicago Herald, Nov. 18, 1916.

Let us examine the real problem of adequate nutrition at a low cost in a more critical manner. The average adult requires 3,000 calories a day in the form of food fuel. If only $25 is spent each month for food, little more than 80 cents a day is available for this purpose. For a family of five requiring, say, 12,000 calories, this means only 7 cents for a thousand calories. How much more helpful it would be to teach the needy something of fuel values in relation to cost, as Mrs. Rose[2] has lately attempted in an instructive manner. If housewives understood that foods can be classified into many groups, including some costing less than a cent per hundred calories, and that the range of choice is very large; if they could be made to realize that a mere bill-of-fare is no guarantee of appropriate nutrition; if they were encouraged to appreciate the significance of food values and to understand, for example, that a can of tomatoes is little else than flavored water which gains its popularity in part because of flavor and color; if they became convinced of the false economy of restaurant living with its high calory cost in the form of apparently low priced dishes — if these and innumerable other details such as are today ascertainable[3] were disseminated intelligibly, some commendable progress might be made.

The newspaper notoriety of a few diet recipes is a poor substitute for the best that modern nutrition investigations can teach. Mendel[4] has lately emphasized anew that the nutrition of the great mass of the people is a question of the highest importance, deserving far more attention than it has hitherto received. Man no longer depends on instinct alone for guidance in the affairs of life, even in matters of diet. Instruction in domestic science ought to become a means of solving some of the problems of applied nutrition; but progress in this connection does not come solely from menu-making.

In addition to its lack of intrinsic novelty or scientific innovation, the Chicago exhibition — we hesitate to call it an experiment — fails to afford any adequate index of the satisfactory nutrition of its subjects. Every physiologist knows how elusive an occasional body weight may be in this respect. A loss of body protein or fat is often temporarily obscured by the deposition of water in the tissues. Even somewhat sustained gains or maintenance of weight sometimes fail to betray food deficiencies. A nursing mother needs lime-bearing foods; a growing child requires milk; one-sided diets must be avoided with discrimination; adequate calories must include a modicum of protein. Nothing less than a critical and truly scientific estimate will insure the inclusion of these and other essential provisions. An education of the public in these directions would represent a real advance.

2. Rose, Mary Swartz: Feeding the Family, New York, The Macmillan Company, 1916.
3. Compare, for example, the data in Gephart, F. C., and Lusk, Graham: Analysis and Cost of Ready-to-Serve Foods, Chicago, American Medical Association, 1915.
4. Mendel, L. B.: Changes in the Food Supply and Its Relation to Nutrition, Yale University Press, 1916.

Current Comment

A DOUBTFUL COMPLIMENT TO EVANSVILLE

"Doctors Cavrill and Culver, the two doctors of the Interstate Doctors, who have been in the city several days looking the field over for a site for the new Indiana institute, have at last decided that Evansville is a most promising city in Southern Indiana and accordingly the institute will be located here."

This is the first paragraph of an advertisement sent us during the past few days from Evansville, Ind. The Interstate Doctors, as the readers of THE JOURNAL know, is an organization of quacks which locates in "easy" communities, relieves the credulous sick and near-sick of their money and leaves when the glittering fiction in its advertisements has been dimmed by the accumulated force of facts. Although our records, based on the official records of every state in the Union, are exceedingly complete, we find no reference to any "Dr. Cavrill." Our files show that Indiana has a Dudley M. Culver who was advertised as one of the "consulting physicians" of the Dr. J. W. Kidd Company's mail-order fakery that operated from Fort Wayne for a good many years but finally went out of business when the federal authorities charged it with conducting a fraud. We also find reference to a "Dr. Culver" who was operating in Elkhart in 1914 under the name "United Doctors," and the terms "United Doctors" and "Interstate Doctors" seem to have been used with an indiscriminating flexibility by the same organization of quacks. Goshen, Ind., had an experience with the Interstate Doctors in the spring of 1915. Goshen, however, refused to be "easy." It has a wide-awake organization of business men known as the "Retail Merchants' Association." According to the Goshen *Daily Democrat* of April 13, 1915, the Retail Merchants' Association of that town suggested to the Interstate Doctors that Goshen was really not a healthy place for quacks to locate. Quoting from the newspaper: "When an ultimatum was laid down by the Retail Merchants' Association, the doctors . . . decided to give up without making a contest. They reasoned a fight would be too expensive." If the people of Evansville had a full realization of what concerns like the "United Doctors," "Interstate Doctors," "Botanical Doctors" and other euphoniously named quack organizations really were, it is not likely that any newspaper would publish the fact that the quacks, after looking over a city, decided that it was a most promising location! It is not likely, for instance, that an item such as this would appear in any newspaper even at "special" advertising rates:

"Flashy Dick, the well-known 'green-goods' man, and Bill Sykes, the second-story artist, were in town recently looking over the prospects of business. After sizing up the citizens of our city, they decided that Blankville is a most promising locality and decided to locate here at least for a time."

No. It is hardly conceivable that any newspaper would publish an item of this sort even if offered as advertising. There are certain forms of deceit that the public is so familiar with that it needs little warning against them; there are other humbugs, of a semi-technical nature, with which the public is not so well acquainted. The operations of itinerant and semi-itinerant quacks belong to the latter class. It remains to be seen whether Evansville will go on record as belonging to the "sucker" class.

TOXICITY OF SALVARSAN

From the reports of Ormsby and Mitchell, Moody and Ellis, in this issue of THE JOURNAL, it would appear that at least some of the salvarsan recently on the market has been unusually toxic. One wonders how many others have had similar experiences. Since the war began the supply of salvarsan and neosalvarsan has been short, at times seriously so. Meanwhile, other preparations, such as diarsenol, made in Canada, and arsenobenzol, made in Philadelphia under the direction of Professor Schamberg, have been more or less used. Professor Schamberg, as will be noted from his statement elsewhere in this issue, ceased to furnish his preparation as soon as the patentees were again able to supply the foreign product. This is to be regretted since it seemed to be giving perfect satisfaction, and especially since it could be furnished to hospitals and to charitable institutions at a price much less than the foreign product. Diarsenol, however, is still being used, probably to a considerable extent, although not openly imported.

HEALTH CONSERVATION IN STEEL MILLS

The United States Bureau of Mines urges[1] the importance of extending the "safety first" idea so as to include "health first." The prevention of ill health is discussed as a plain business proposition, of quite as much importance in industrial life as the prevention of accidents. As a first step in health conservation, a physical examination of all employees is recommended, so that infectious or contagious diseases may be discovered in their incipience and their spread controlled. Undue fatigue, caused by laborious or fast work, long periods of work, monotony or complication of muscular movements, constant strain or standing, or lack of variation of periods of relaxation, constitutes one of the most common causes of occupational disability. High temperature or humidity, excessive glare or improperly placed lights, loud or continued noises and constant vibration also produce fatigue. Emphasis is laid on proper illumination as intimately associated with efficiency, safety and bodily welfare. In some mills, increased efficiency varying from 2 to 10 per cent. has been reported as a result of improved lighting conditions. Adequate ventilation includes air removal and the removal of harmful products. Special conditions found in steel mills are fumes, gases and dust, and harmful conditions of temperature and humidity. The most effective means of removing dust, in Watkins' opinion, is by a carefully designed and constructed exhaust system. Continued exposure to high temperature and humidity increases susceptibility to disease and should be counteracted by provisions for free circulation of air, lowered temperature,

1. Watkins, J. A.: Health Conservation at Steel Mills, Technical Paper 102, U. S. Bureau of Mines.

minimum length of exposure to heat, ample bathing facilities and plenty of drinking water. All provisions for the well-being of the workers may fail unless enforced by education. This may be carried on by the plant physician and by means of circulars, some suggested titles for which are: Protect Your Eyes; See the Doctor; Workmen, Take Care of Your Health; Watch Your Teeth; Don't Go Home Dirty; Watch Your Feet.

SANATOGEN—THE HUMORS OF WAR

Even the European war with all its horrors is responsible for some human actions which add to the gaiety of nations. By turning to the London Letter[1] in this issue, readers of THE JOURNAL will learn that the British-made Sanatogen, which for some years has been made in England, is no longer to be manufactured—as Sanatogen! This glorified *Schmierkäse* combination is now going to be made in the British Isles by a British concern and sold under another meaningless but equally euphonious name. The English have evidently made up their mind that if they are going to be humbugged it shall not be with a German product. Surely this is patriotism raised to the nth power. One is reminded of the classic advertisement of a storekeeper: "Why Go Elsewhere and Be Humbugged; Come in Here."

INDUSTRIAL DISEASES IN NEW JERSEY

Under the New Jersey law, lead, phosphorus, arsenic or mercury poisoning contracted as a result of occupation is reportable. The state board of health report for 1915 shows that there were reported during the year fifty-six cases of lead poisoning, two cases of mercury poisoning, one case of arsenic poisoning and six cases of anthrax. The board, while required to collect statistics of industrial diseases, has no authority to regulate conditions in factories in which such diseases occur. Such reports, while interesting, are comparatively valueless unless supplemented by amendatory legislation, giving the state board power to deal in a remedial way with the conditions which produce diseases.

PROPOSED AMENDMENT OF BRITISH SOCIAL INSURANCE ACT

The British Social Insurance Act was passed in 1911. In January, 1916, a committee was appointed to consider amendments to the financial provisions of the law and to recommend measures to simplify its administration. The committee has now reported. During the three years in which the law has been in operation the contributions of the male beneficiaries of the act were in general sufficient, although some particularly hazardous occupations or unhealthy localities consistently show a rate of sickness in excess of the average. The committee finds, however, that the amount paid by women beneficiaries has fallen short of the requirements. Married women appear to be subject to a greater amount of sickness than women generally. The committee recommends releasing a part of the contributions to the sinking fund to meet the current needs of the approved societies, so as to provide an immediate increase in the amount available for the payment of benefits to women, the accumulation of a special reserve fund and the creation of contingency and special risk funds. The committee also recommends a number of amendments affecting principally the relations of the various approved societies to the various funds established by the law.

1. Page 1771.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Physician's Wife Dies.—The death of Dr. Philip Mills Jones, San Francisco, November 27, was followed, two days later, by the death of his widow, also from pneumonia. They were buried together, December 1.

Personal.—Dr. Hjalmar Kylberg, Merced, has been elected republican assemblyman from the forty-ninth district.——Dr. Leo Eloesser, assistant professor of surgery at Stanford University, has received a cross of merit from the Grand Duke of Baden, for his services in the German military hospital in Baden.

COLORADO

Personal.—Dr. John S. Fox, Silverton, has returned after a year and a half of service in an American hospital unit in Northern France.——Dr. Richard W. Corwin, chief surgeon of the Colorado Fuel and Iron Company, has returned after several months in France as assistant to Dr. Alexis Carrel.——Dr. William H. Halley, Rouse, has been appointed assistant chief surgeon of the Colorado Fuel and Iron Company, with headquarters at Pueblo.——Dr. Paul W. Carmichael, Denver, has been appointed camp physician for the Colorado Fuel and Iron Company at Rouse.——Dr. Charles A. Powers, Denver, has returned after six months' service at the American Ambulance Hospital, Paris. He will resume his work there in April, next.

Medical Library Opened.—The new library building, erected for the Medical Society of the City and County of Denver, at 620 Court Street, was formally opened, November 29, with a banquet, reception and dedicatory address. The dinner was attended by nearly 200 guests, and at its close the formal dedicatory exercises took place. The address of the evening was delivered by president Livingston Farrand of the University of Colorado, and dealt with "The Histories of the Greater Men in Medicine." This was followed by a congratulatory address by Dr. Fielding H. Garrison, Washington, D. C., on behalf of the Library of the Surgeon General's Office, United States Army, and addresses by members of the society. The new building is a model of its kind; the lighting and sanitary arrangements are ideal; there is a floor space of 125 by 50 feet, with 315 feet of new double-faced steel stacks. The library was started in a very small way in 1893 as the Colorado Library Medical Association, and now subscribes for about 225 current medical journals and has a library of more than 18,000 bound volumes.

ILLINOIS

New Hospital Opened.—The new Robinson Hospital is completed and Drs. Herbert N. Rafferty, Cyrus E. Price, Jonas W. Carlisle and A. Lyman Lowe have moved their offices into the new building. A reception was tendered to the local neighboring physicians at the hospital, November 24, and it was opened on the following day.

After-Care of Infantile Paralysis Victims.—The Illinois State Board of Health has sent to New York a representative to study the methods there employed for the care of patients with infantile paralysis and the paralysis and deformities

following. It is intended to establish clinics in every county in Illinois where patients will be given free the benefit of the best possible treatment.

Personal.—Drs. Brian and Edwards, St. Francisville, sustained painful injuries, November 18, by the overturning of their automobile, while making a professional call.——Dr. Franklin B. Van Nuys, Arcola, announces that he will retire from practice and will devote his entire attention to the management of his farm near Vandalia.——Dr. Lincoln S. Lacy, Pittsfield, has been appointed surgeon of the Wabash System, succeeding Dr. Samuel B. Peacock, resigned.

New Antituberculosis Officers.—At the annual meeting of the Illinois Association for the Study and Prevention of Tuberculosis, held at Springfield, November 9 and 10, a new constitution and by-laws was adopted and the name of the organization was changed to the Illinois Tuberculosis Association and the following officers were elected: president, Dr. George T. Palmer, Springfield; vice presidents, Dr. William A. Evans, Chicago; Hon. E. M. Mangan, Aurora; Dr. Charles B. Johnson, Champaign, and Dr. Lewis C. Taylor, Springfield; secretary, Dr. Jeanette C. Wallace, Peoria, and treasurer, Mr. David R. Forgan, Chicago, and executive committee, Drs. James W. Pettit, Ottawa; Ethan A. Gray, Chicago; Edward W. Fiegenbaum, Edwardsville; Orville W. McMichael, Chicago; Mr. George W. Perkins, Chicago, and Mrs. L. A. Adams, Jacksonville.

The County Sanatorium Question.—At the last election eight counties in Illinois voted for the establishment of a county sanatorium and two against it. In Adams County the majority for the sanatorium was 6,831; in Champaign County, 6,079; in Kane County, 11,038; in La Salle County, 9,501; in Livingston County, 3,538; in Morgan County, 5,036; in McLean County, 1,947, and in Ogle County, 814. The sanatorium proposition was defeated in Greene County by a majority of 725; in Rock Island County by a majority of 1,203. In Champaign and McLean counties the votes cast by men and women were not separated but in the other six counties the following majorities for the sanatorium prevailed: Adams County, women 3,303 and men 3,528; Kane County, women 5,358 and men 5,680; La Salle County, women 5,052 and men 4,449; Livingston County, women 2,262 and men 1,276; Morgan County, women 2,761 and men 2,275; Ogle County, women 868 for and men 544 against the sanatorium. In the two counties in which the sanatorium proposition was defeated the majorities were as follows: Greene County, women 168 and men 557; Rock Island County, women 5,427 and men 6,612.

Chicago

Chicago Institute of Medicine.—At the annual meeting of the Chicago Institute of Medicine, held December 5, Drs. Frank Billings, N. S. Davis and Frank S. Johnson were elected members of the board of governors.

Personal.—Dr. Otto L. Schmidt was elected second vice president of the Chicago Historical Society at its annual meeting, November 21.——Dr. Hayes W. Carlin suffered a fracture of the left leg by the overturning of his automobile, November 20.

IOWA

Poliomyelitis.—On account of the presence of infantile paralysis in Calhoun County, with three cases at Lohrville, the school authorities decided on November 18, to close the schools of that place until December 4.

Hospital Notes.—The new wing of the Evangelical Deaconess Hospital, Marshalltown, was formally dedicated, November 15.——A campaign for the People's Hospital, Waterloo, has resulted in subscriptions of $22,000 in fourteen days. The amount required is $75,000.

Medical Library Urged.—The state librarian in his annual report urged the governor to recommend the establishment of a medical department in the state library. It is proposed to ask for an annual appropriation of $2,000 for the purchase of books and magazines and their transmission to the physicians of the state, and $2,400 annually "as a salary for an expert librarian, trained in medicine and surgery and in the languages in which medical and surgical literature is commonly written and published."

Typhus Fever.—Several cases of typhus fever have occurred at the Atchison, Topeka and Santa Fe Railway Employees' Hospital, Fort Madison. Six cases have been reported, with one death. The railway company took prompt action and in cooperation with the state board of health has the condition well in hand.——A special disinfecting car of the road has traversed the lines of the road in Illinois and Iowa, fumigating and disinfecting all Mexican employees and their clothing and bedding, and the process will be carried out throughout the entire length of the line.

Society Elections.—At the twelfth annual meeting of the Second District Medical Society of Iowa, held in Davenport, November 12, the following officers were elected: president, Dr. Elon B. Gilbert, Geneseo, Ill.; vice presidents, Drs. Henry Matthey, Davenport, and J. Lynn Crawford, Cedar Rapids; secretary-treasurer, Dr. John V. Littig, Davenport.——At the annual meeting of the Scott County Medical Society, held in Davenport, November 10, Dr. James Dunn was elected president; Dr. Frank Neufeld, vice president; Dr. Roscoe P. Carney, secretary and Dr. Sidney G. Hands, treasurer, all of Davenport.

Personal.—Dr. Henry Matthey, Davenport, has returned after several months' service with the German Red Cross.——Dr. Arthur C. Echternacht, Mason City, who has been on border duty with the Iowa National Guard, has returned home on a furlough.——Dr. Lee M. Coffey, Keokuk, who has been ill with typhoid fever, has recovered and resumed practice.——Dr. Chanley J. Lukens, Albia, is undergoing treatment at St. Joseph's Hospital, Ottumwa.——Dr. David Q. Storie, Chariton, is reported to be seriously ill.——Dr. Henry P. Mason, Wilton, is under treatment for septicemia in a hospital in Chicago.

MAINE

Personal.—Dr. Warren G. Sawyer, Madison, has been appointed medical examiner for Somerset County.——The town of Old Orchard has been sued by Dr. Harold A. Pingree, Portland, to recover $142, alleged to be due him for an operation and attendance on a patient in October of last year. It is said that Dr. Pingree was engaged by a member of the Board of Selectmen of Old Orchard to attend the patient.

New Officers.—At the annual meeting of the Maine Antituberculosis Association, held in Bangor, November 3, the following officers were elected: Dr. William C. Peters, Bangor, president, and Drs. John E. Wadsworth, Skowhegan and Elmer D. Merrill, Foxcroft, vice presidents.——The Penobscot County Medical Association held its sixty-second annual meeting in Bangor, November 19, and elected Dr. William P. McNally, president; Dr. John B. Thompson, vice president, and Dr. Harris J. Milliken, secretary-treasurer.

MARYLAND

Japanese Professor Inspects Hospitals.—Dr. Waichiro Ocado, professor of medicine at the University of Tokyo, who is making a tour of inspection of the hospitals of the United States, visited Baltimore, November 22.

Laboratories Moved.—The research departments of Johns Hopkins Medical School are being transferred to the new Hunterian Laboratory Building, located at the corner of Wolfe and Madison streets. The building is five stories in height, constructed of red brick with sandstone trimmings, and will house the school library and all research laboratories.

Typhoid at Goucher College.—Seven cases of typhoid fever have been found among the students of Goucher College, and a rigid investigation is being made by the health department. The situation is regarded as serious, but officials at the health department as yet have been unable to ascertain the source of the contagion. Three of the students suffering from the disease live in the dormitories of the college, and the others reside at their homes in the city.

Personal.—Dr. Oscar H. McNemar, Odentown, is under treatment at the Emergency Hospital, Annapolis, for an accidental gunshot wound of the face, neck and shoulder, received while hunting, November 14.——Dr. Joseph C. Bloodgood, Baltimore, delivered a lecture at Greenville, S. C., November 13, on "The Prevention of Cancer."——Capt. Clarence P. Erkenbrack, Baltimore, who has been on duty at the border with the First Maryland Infantry, has resumed his duties as health warden of the twenty-second ward.

MASSACHUSETTS

Coroners Appointed.—The following appointments of medical examiners are announced: Dr. Edward S. Winslow, Hampshire District, succeeding Dr. Clarence I. Sparks, Easthampton; Alphonso V. Bowker, Athol, reappointed; Dr. Harry

B. Holmes, Adams, reappointed; Dr. Horace K. Foster, Peabody, reappointed; Dr. Homer Z. Leach, Hardwick, succeeding Dr. William J. Heffner, Hardwick.

Poliomyelitis.—The opinion was expressed unofficially by the health authorities of Massachusetts, December 1, that the poliomyelitis epidemic had died out in the state. No new cases had been reported during the previous forty-eight hours. The mortality figures have not been compiled, but it was estimated that there had been about 100 deaths. Since January 1 there had been 1,892 cases, 179 of which had been reported in November, as against 702 in October.

After-Care of Infantile Paralysis—The Orthopedic Department of the Children's Hospital, Boston, offers a course, which began December 1, in muscle training and in the principles of nursing after-care of infantile paralysis. The course is an all day course, covering a period of about six months and is opened to a limited number of properly qualified women. The fee, which is payable in advance, is $100, and the money received will be used for the maintenance of the clinic. Robert W. Lovett is in charge of the course.

Physicians Fined.—Dr. Joseph B. Twadelle, Boston, who was indicted last month, charged with having facilitated transportation of smuggled heroin and morphin, is said to have pleaded guilty in the federal court and to have been fined $500.——Dr. Louis A. Hermann, Boston, charged with a similar offense, is said to have been convicted of the alleged sale of drugs and fined $1,000.——The State Board of Registration and Examination, on November 16, was reported to have revoked the licenses of these two physicians.

Personal.—Dr. Daniel B. Reardon, Quincy, and Allen Greenwood, Waltham, both of whom served in the Harvard Medical Unit on the western front, delivered addresses before the Boston chapter of the American Institute of Bankers, November 16. The addresses were illustrated by photographic slides.——Dr. Raphael C. Thomas, Boston, sailed, December 8, for the Philippine Islands, where he will be in charge of the Union Hospital, Iloilo.——Dr. Herbert J. Cronin has been appointed accident prevention physician of Boston.——Dr. Edward P. Bagg, Jr., has been reappointed station physician of the Holyoke Hygiene Association, and Dr. Fred H. Allen has been elected medical director of the association.

MICHIGAN

Appropriation for Sanatorium.—Supervisors of Wexford County have appropriated $3,000 for a tuberculosis sanatorium.

Marine Hospital at the Soo.—A station has been established by the United States Public Health Service in the Federal Building, Sault Ste. Marie.

Social Service Course.—Under the direction of the Detroit Board of Health, courses of lectures in social service are being given on Mondays and Fridays at the Board of Health Clinic.

Smallpox at Traverse City.—There have been fifty-five cases of smallpox reported at Traverse City. Of these, twenty-five have already been released from quarantine and no further outbreaks are now expected.

Personal.—Dr. Victor C. Vaughan, Ann Arbor, delivered a lecture at the Baptist Church, Manistique, November 22, on "Euthenics, or the Influence of Environment."——Dr. James Sooy has been appointed city analyst of Flint.——Dr. Todd J. Wilson has resigned as a member of the staff of the Negaunee Hospital and has moved to Grand Rapids.——Dr. George Manting, Holland, has been appointed surgeon to the American Steel Company at East St. Louis, Ill.——A banquet was held by the citizens of Clare, October 24, in honor of Dr. Thomas H. Maynard, who has just completed a half century of medical practice.

MONTANA

Hospital Notes.—The New Conrad Hospital, erected by the Conrad Benevolent Association, was formally dedicated to the public service, October 8. The building is a three-story brick structure, containing thirty rooms, with all modern facilities. On the first floor there is a ward which will accommodate ten patients. The institution is under the charge of H. W. Power, W. L. DuBois and W. F. Patterson.——More than $12,000 of the fund required for the Deaconess Hospital, Bozeman, has already been subscribed.——A two-story and basement brick addition to the White Fish Hospital is under construction.

NEBRASKA

Personal.—Dr. Ward W. Hedlund, Lincoln, has been appointed third assistant physician at the Hastings State Hospital, succeeding Dr. Danielson, resigned.——Dr. Arthur J. Wilson, Omaha, fell and fractured his skull. He is under treatment at St. Joseph's Hospital.

Broader Plane for Health Matters.—A meeting was held in Lincoln, November 9, at which committees from each medical society of the state, together with a committee from the Health Officers' conference and the secretaries to the state board of health, formulated a bill to present at the coming session of the legislature regarding the reorganization, on a broader plane, of the health and sanitary matters of the state. Every principle of the bill submitted was approved by the joint committee, and a committee consisting of one member from each organization was selected to complete the new bill.

NEW YORK

New Sanatorium.—Under the guidance of Deputy Commissioner Dr. Charles S. Press, Troy, the campaign for the erection of a new tuberculosis sanatorium for Rensselaer County was carried to a successful conclusion at the last election.

Personal.—Dr. Karl Connell, Elmira, who has been serving in Europe for nearly two years and has recently returned from the Mexican border, delivered an address before the Elmira Academy of Medicine, November 15.——Dr. William L. Culpepper, assistant city bacteriologist and instructor in hygiene and public health at the Syracuse University College of Medicine, has resigned to become field director of the International Health Board in South Texas.

Medical Inspection Day.—Tuesday, December 5, was observed throughout the state as Medical Inspection Day. On this day, Dr. Hermann M. Biggs, commissioner of health, requested that the people of the state consult their physicians in order to determine whether or not they are in good health. The reason for this request was the fact that the death rate of individuals over 45 years of age is steadily increasing in the United States.

New York City

Court Decision Upholds Sanitary Code.—A decision recently handed down by Justice Rodenburg of the supreme court of the state upholds the right of a city to apply the blood test to ascertain whether a milk dealer is a carrier of typhoid fever.

Maternity Hospital to be Built.—At a meeting of the Maternity Hospital Society of East New York and Brownsville, held October 13, the chairman of the building committee reported that preparations had been made to break ground for the erection of the hospital in the early spring.

Harvey Society Lecture.—The fourth lecture in the twelve-lecture course of the Harvey Society will be delivered at the New York Academy of Medicine, December 16, by Prof. Henry H. Donaldson of the Wistar Institute of Anatomy and Biology, Philadelphia, on "Growth Changes in the Mammalian Nervous System."

Pneumonia Discussed.—At the December 7 meeting of the New York Academy of Medicine, pneumonia was the topic for the evening. Dr. Rufus I. Cole spoke on "The Nature of the Disease and the Serum Treatment." Dr. Alfred E. Cohn discussed "The Use of Digitalis," and Dr. Alan M. Chesney, "The Treatment by Optochin."

Fund for Paralysis Service.—Plans to raise an emergency fund of $1,000,000 for visiting nurse service and other activities of the Henry Street Settlement have been announced. Almost $600,000 has already been subscribed to the fund, which is being raised to meet the extra demands on the settlement, and largely on the service for the treatment of convalescence after infantile paralysis.

New York County Medical Society Elects.—At the one hundred and eleventh annual meeting of the Medical Society of the County of New York the following officers were elected to serve for the year 1917: president, Dr. J. Bentley Squier; vice presidents, Drs. Charles H. Peck and Lugwic W. Kast; secretary, Dr. Daniel S. Dougherty; assistant secretary, Dr. J. Milton Mabbot; treasurer, Dr. Frederic E. Sondern, and censors to serve for two years, Drs. William S. Gottheil, Ward B. Hoag and Alexander Lyle.

Civil Service Examination.—The municipal civil service commission states that applications will be received from

December 1 to December 15 for the position of physician for the examination of mentally defective children (psychiatrist), Grade 4. There is one vacancy to be filled in the position of senior physician for the examination of mentally defective children, with a salary of $2,520, in the board of education, and three vacancies for resident physicians for mental defectives with a salary of $1,500, in the department of public charities. The examination is open to all citizens of the United States.

City to Transport Paralysis Victims.—A meeting of the New York committee on the after-care of infantile paralysis patients met recently for the purpose of dissolving, because it was understood that the city had undertaken to carry the victims of last summer's scourge from their homes to the hospitals for treatment and back again. After a prolonged discussion, however, the committee decided to continue its work for a time. The charity department announces that enough money has been allowed for transportation and that as soon as they can decide on the best type of motor bus to use the work will be begun.

PENNSYLVANIA

Personal.—Dr. Anthony F. Myers, Blooming Glen, for twenty-three years secretary and treasurer of the Bucks County Medical Society, was presented by his fellow members with a watch and chain in recognition of his energetic service for the society.——Dr. George J. Van Vechten, Scranton, has been appointed director of the department of health of Scranton.——Dr. Edward S. Dickey, Pittsburgh, has returned after several months' service in the Russian army.——Drs. Irwin D. Metzger, Pittsburgh, and Calvin L. Johnstonbaugh, Bethlehem, have been reappointed members of the Bureau of Medical Education and Licensure.——Drs. Howard W. Arthurs and T. A. Hogan, Pittsburgh, have been appointed members of the Board of Dental Examiners.——Dr. Walter H. Brown of the Bucks County Medical Society has resigned as epidemiologist of the Massachusetts State Department of Health to take up work as executive officer of the Bridgeport, Conn., board of health.——Dr. Nathaniel E. Silsley, Scottdale, who was operated on in the Columbia Hospital, Pittsburgh, November 6, returned to his home, November 29, much improved in health.

Clean Milk Campaign.—The Northumberland County Medical Society has undertaken a thorough campaign of education for the obtaining of clean milk, and makes the following suggestion for incorporation in borough ordinances: (1) registration of all milk and ice cream dealers with the secretary of the borough board of health; such legislation including the filing with that official of (*a*) a U. S. Department of Agriculture score card on which each farm supplying milk or cream to the borough is given a rating of 70 per cent. or over by a competent physician or veterinarian, and (*b*) of a physician's certificate showing freedom from communicable disease on the part of all persons engaged in handling such milk before delivery to the consumer. Registration is to be renewed at the end of three months, and fees for same are to be arranged on a scale to cover monthly examinations of milk for traces of preservatives added in violation of state law. (2) Limitation to a reasonable period of the age of milk to be offered for sale or to be pasteurized for sale. (3) Forbidding repasteurization of milk for sale in the borough.

Philadelphia

Society's Twentieth Anniversary.—The Philadelphia Pediatric Society will celebrate its twentieth anniversary at the College of Physicians, December 12, and the speakers will include Dr. Frank Spooner Churchill, Chicago; Dr. Henry Dwight Chapin, New York, and Dr. John Howland, Baltimore. The meeting will be followed by a reception at the Hotel Rittenhouse.

Change in Drug Law.—November 29, in the final presentment made in the quarter sessions court, the November grand jury urged an immediate change in the law governing the sale of narcotics. Since the change in the Harrison Narcotic Law, drugs can easily be obtained with little money, and the number of patients and prisoners resulting from their use has increased to alarming numbers.

Medical Institutions About Philadelphia.—Hospital week, for the first time in Philadelphia, was observed, November 26 to December 3. The churches of the city were in charge. ——Following up the new plan of utilizing neighborhood hospitals for clinical study, the Kensington branch of the Philadelphia County Medical Society held its meeting, December 8, in the Kensington Dispensary for the Treatment of Tuberculosis.——The Pennsylvania School for Social Service was opened September 25, with over thirty pupils. Mr. Bernard J. Newman, formerly general secretary of the Philadelphia Housing Commission, is the new director.—— The Home for Incurables will receive about $300,000 from the estate of the late T. Morris Knight, according to an inventory recently made.——During the past year the German Hospital treated free of charge 4,031 dispensary patients and 1,438 ward patients.

Personal.—Dr. Burton Chance has been made attending physician at the Wills Eye Hospital.——Dr. T. Hollingsworth Andrews, after 52 years of practice, has announced his retirement from active work.——Dr. Barton K. Thomas, Pottstown, has been made an instructor of clinical medicine in Jefferson Medical College.——Dr. Nelson M. Percy, Chicago, will deliver the 1916 Mutter lecture on surgical pathology at the College of Physicians, December 15. His subject will be "Pernicious Anemia, with Special Reference to its Surgical Management."——Dr. Simon Flexner of the Rockefeller Institute, New York, read a paper, December 6, before the College of Physicians on "Epidemic Poliomyelitis; Its Nature and Mode of Infection," and Dr. Haven Emerson, commissioner of health of the same city, delivered an address on "Some Practical Considerations in the Administrative Control of the Disease."

UTAH

Public Health Association Organized.—A local branch of the Utah Public Health Association was organized in Ogden, November 16, and Drs. Edward I. Rich, Walter E. Whalen and Robert S. Joyce were elected directors.

Typhoid Fever.—Typhoid fever is reported to be prevalent in Price and other places in Carbon County, and investigation by the secretary of the board of health disclosed the fact that the water supply is polluted. For several years the state board of health has issued warnings to residents of the county, and has called attention to the necessity for protecting the water supply.

WISCONSIN

Poliomyelitis.—For the week ending November 19 there were six new cases of poliomyelitis in the state at the following places: two at Galloway and one each at Kenosha, Arcadia, Milwaukee and Osceola. The total number of cases since July 1 was 459. The state health board, in its *Quarterly Bulletin*, calls attention to the fact that instant and drastic quarantine results when a case of poliomyelitis is reported, whereas measles elicits little attention from neighbors and citizens, although the death rate for measles is higher than that for poliomyelitis, and frequently measles shows that it possesses higher potentialities for complications following the disease.

University Extension Medical Teaching for County Societies.—The State Medical Society of Wisconsin has secured the cooperation of the full-time medical teachers of the University of Wisconsin and of Marquette University and has issued a circular to its component societies giving a list of these instructors, who are ready to respond to requests from county societies to take part in their scientific programs. The societies are expected to provide for the traveling expenses of the lecturers, and arrangements for assigning these men to places on the programs of the different county societies may be made either through the secretary of the state association or by the secretaries of the county societies, addressing the lecturers directly. The Wisconsin organization is planning from this beginning to develop a real graduate extension teaching course to be at the service of the medical profession of the state.

CANADA

Hospital Fire.—Fire partly destroyed Grace Hospital, Toronto, on the morning of November 28. The inmates, 116 adults and nineteen babies, were all removed in safety. Much praise is given to two house physicians and the nursing staff for their work in rescuing the patients.

Ontario Hospital at Orpington Doubled.—The Ontario government has sent instructions to England for the immediate preparation of plans and estimates for the enlargement of the Ontario Military Hospital at Orpington, England. When completed this will give a capacity for 2,014 beds, as against 1,040 as at present. For the present the medical staff will not be increased. All reports go to show that the work of the staff sent from Ontario has been eminently satisfactory to the English authorities.

Decision Regarding Watered Milk.—In the province of Manitoba a dairyman was fined $50 for selling watered milk. The prosecution was under the Public Health Act which provides that there shall be no appeal from any conviction under this act. Counsel for the dairyman brought an appeal before the Court of Appeal of the province, contending that it was *ultra vires* for the legislature of Manitoba to attempt to fix standards for milk or cream and that this function belonged exclusively to the Dominion government. The court, however, refused the appeal, declaring that it had no jurisdiction.

Feebleminded in Toronto.—The Public Health Section of the Academy of Medicine, Toronto, held a symposium on the feebleminded on November 30. Dr. St. Clair Hincks said that after two and one half years of investigation the results of 1,445 examinations have been compiled. Fifty-five per cent. of feebleminded persons examined are habitual criminals; 285 are habitual thieves, all of whom are still at large in the city; 59 take delight in burning down buildings; 120 have murderous tendencies; 60 per cent. of all the social victims on the streets are feebleminded, and 178 women were examined who were sex crazy, suffering from a vile disease. In 201 cases of absolute incorrigibility among feebleminded schoolchildren, examination showed 53 as being the victims of sexual immorality. Dr. Charles K. Clarke criticized severely the callous neglect of the feebleminded by the authorities.

Personal.—Mr. F. A. Dallyn, C. E., provincial sanitary engineer for Ontario, has left for Europe to study sewage and water problems.——Capt. Murray H. Patterson, attached to an English regiment as medical officer, and recently awarded the Military Cross for distinguished conduct in the field, is at his home in Chatham, Ont.——Capt. Arthur W. M. Ellis, son of Prof. William H. Ellis of the University of Toronto, has succeeded Lieut.-Col. George G. Nasmith, C. M. G., in charge of sanitation of the Canadian camps in France. Dr. Ellis was on the staff of the Rockefeller Institute, New York, when the war broke out, and went abroad with the first Canadian overseas force.——Capt. W. Harley Smith, Toronto, with the Ontario Military Hospital at Orpington, Kent, England, has been promoted to major.——Capt. A. Grant Fleming of the City Hall laboratory staff, Toronto, left for overseas in October with a draft from the C. A. M. C., training at Camp Borden.——Dr. Hamilton F. Biggar, an early graduate of Victoria University, Toronto, now located in Cleveland, has given $5,000 to found a scholarship at Victoria University.——Dr. Harold D. Ball, Toronto, left in October for England, where he will be attached to Moore Barracks Hospital, Shorncliffe.——Col. Arthur Mignault, M.D., home from the front on leave of absence, has been appointed to take charge of recruiting in the Province of Quebec.

GENERAL

Gastro-Enterologists Organize.—The Southern Gastro-Enterological Association was organized at Atlanta, November 15, and the following officers were elected: president, Dr. James C. Johnson, Atlanta; vice president, Dr. Jesse T. Rogers, Savannah, and secretary-treasurer, Dr. Marvin H. Smith, Jacksonville, Fla.

Ohio Valley Association Meeting.—The eighteenth annual meeting of the Ohio Valley Medical Association was held in Evansville, November 21 to 23, and the following officers were elected: president, Dr. William Shimer, Indianapolis; vice presidents, Drs. J. Rawson Pennington, Chicago; Walter F. Boggess, Louisville, and Meyer L. Heidingsfeld, Cincinnati, and secretary-treasurer, Dr. Benjamin L. W. Floyd, Evansville.

Tri-State Officers.—At the thirty-third annual meeting of the Tri-State Association of Tennessee, Arkansas and Mississippi, held in Memphis, November 21 to 23, the following officers were elected: president, Dr. James W. Gray, Clarksdale, Miss.; vice presidents, Drs. H. Rogers Hays, North Carrollton, Miss., Richard W. Griffin, Tiptonville, Tenn., and Floyd Webb, Turrell, Ark.; secretary, Dr. James L. Andrews, Memphis (reelected), and treasurer, Dr. James A. Vaughan, Memphis (reelected).

Orthopedists to Meet.—The annual meeting of the Central States Orthopedic Club will be held at Cleveland and Cincinnati, December 27 and 28. The first day's meeting will be held at Cleveland. Clinics will be held at the new Mount Sinai, Lakeside and St. Luke's hospitals. In the afternoon the club will go to Elyria and visit the Gates Hospital for Crippled Children, leaving for Cincinnati in the evening. On the second morning there will be a clinic at the Cincinnati General Hospital and at 5 o'clock the executive session of the club will be held, followed by the annual banquet.

Department of Health at Yale.—Yale University has established a department of health charged with the sanitary safety of the students' surroundings, and for the purpose of furnishing them health supervision and advice. Complete and careful medical examinations will be made of all students engaging in organized athletics, all competitors for the staff of the Yale *News*, the students working in the dining halls, and all freshmen. Any member of the university may consult the staff, vaccination against smallpox and typhoid fever will be provided, and students unable to pay will be taken care of at Yale Infirmary. It is said that a permanent endowment fund of $300,000 will be needed for the department, and it is expected that this sum will be easily raised.

A Suspicious Character.—Correspondence and telegrams concerning an individual who is imposing on the hospitality of physicians and pharmacists have been submitted to THE JOURNAL by a physicians' supply house in a nearby city. It is alleged that the individual represents himself as being "Capt. S. T. Bland-Sutton"—son of Sir J. Bland-Sutton, the English surgeon—commissioned by the War Office in London to purchase medical and surgical supplies for the army. He is described as a rather slender man, of light complexion, with long, prominent nose and two scars on the left side of his face, which he claims to have received in France. He has a typical English accent, and displays an accurate, and apparently first hand, knowledge of medical conditions in the war. He is reported to have "borrowed" a suit of clothes from one hospital intern and a small sum of money from another, and failed to return either.

Bequests and Donations.—The following bequests and donations have recently been announced:

St. Mary's Free Hospital for Children, New York City, Association for Improving the Condition of the Poor, Sea Breeze Experimental Hospital, Coney Island, Morristown, N. J., Memorial Hospital and All Souls Memorial Hospital, Morristown, each $10,000 by the will of Mrs. Annie H. Peckham.

Evanston, Ill., Hospital, a donation of $125,000, by Mr. James A. Patten, contingent on the raising of a public subscription of a like amount.

Children's Hospital of Philadelphia, $10,000 as a memorial to Miss Katherine Holmes Fiske, by the will of Louis S. Fiske.

Presbyterian Hospital, Philadelphia, $10,000, by the will of Jane L. McConnell.

Vancouver, B. C., General Hospital, $50,000, by the will of Mr. J. B. Graves, Kamloops, B. C.

Children's Free Hospital, Milwaukee, $2,000 as a result of a bazaar, given by the Infant Aid Society of the Hospital, November 10.

University of Chicago Medical School, a donation of $250,000 by Martin A. Ryerson, president of the board of trustees.

FOREIGN

The Italian Census.—The figures of the 1911 census for Italy have just been published. It records 28,357 blind and 27,608 deaf mutes to the total population of 34,661,377, June 10, 1911.

Weichselbaum Retires.—A. Weichselbaum, professor of pathologic anatomy at the University of Vienna since 1885, is retiring, having reached the age limit of 71. Professor Kolisko has been appointed in his place. The latter has hitherto been ordinary professor of forensic medicine.

Deaths in the Profession Abroad.—J. de Erostarbe, for many years chief of the medical department of the Spanish navy, and a prolific writer on medical and hygienic matters affecting the navy and the merchant marine, aged 86.——J. P. Picot, professor of clinical medicine at the University of Bordeaux, aged 77. He retired from active work in 1909.

Government Reduces Price of Paper in Spain.—The *Siglo Medico* reproduces the official announcement of the appropriation of a million pesetas to pay the excess cost of paper, for the daily papers, over the price of July, 1914. Our exchange queries "And what about the scientific periodicals? Are we not to share in this benefit?" No reply is forthcoming as yet.

Institute for Inorganic Chemistry Organized at Münster.—The Chemical Institute of the University of Münster has recently been enlarged and endowed to make it a nursery for scientific research also in inorganic chemistry. The Prussian parliament voted it an appropriation for the purchase of machinery, books and other equipment and a number of metal and dynamite firms have raised additional sums.

Potassium Chlorate.—In Japan before the war about 300 tons of potassium chlorate were manufactured, while the con-

sumption was about 4,000 tons annually. Many producers are now in the field, according to Vice Consul M. D. Kirjasoff at Yokahama (*Commerce Reports*, Dec. 1, 1916), and the production has risen to about 3,500 tons per annum, and, by permission of the government, some of it is exported. In the early stages of the war its export was prohibited.

Ehrlich's Successor.—Our German exchanges of October 10 quote the *Frankfurter Zeitung* to the effect that Prof. W. Kolle, chief of the Institute for Bacteriology and Hygiene of the University of Bern, has been called to Frankfurt as successor to Ehrlich in the Institute for Experimental Therapy and also in the G. Speyer-Haus. Wassermann of Berlin was called first, but he yielded to pressure from the local scientific authorities and finally declined. Prof. Hans Sachs, Ehrlich's co-worker, has been appointed director of the Institute for Experimental Therapy, and Professor Morgenroth of the Charité, Berlin, is being considered for director of the Speyer Institute (*stellvetretende Direktoren*).

Waldeyer's Eightieth Birthday.—The senior of the Berlin medical faculty, W. Waldeyer, professor of anatomy at the University of Berlin since 1883, was raised to the peerage (erbliche Adel) by the kaiser on the occasion of his eightieth birthday, October 6. A bronze portrait plaque was presented to him by his present and former pupils, and a duplicate was hung in the headquarters of the Postgraduate Instruction System, the Kaiserin-Friedrich Haus. He has been chairman of the central committee of this work for many years. The Leopold-Karolinische Akademie of Halle presented him with the gold Cothenius medal, and honorary memberships in various scientific and other societies poured in on him. He announced that although he was thinking of retiring from his teaching chair at the university at the close of this semester, yet he intended to keep up his other work.

WAR NOTES

Asks Red Cross to End Relief Work.—Austria-Hungary, through Ambassador Penfield at Vienna, has asked the American Red Cross to discontinue relief work in Belgrade and other parts of Northern Serbia, when supplies now on hand have been distributed. No reason is given for this request.

Deaths in Prison Camps.—Official statistics, which were published in Berlin, December 2, state that on August 1 of this year there were 1,663,794 prisoners of war in Germany. In the two years of the war, 29,297 prisoners had died; of these, 6,032 died from tuberculosis; 4,201 from typhus fever; 6,270 from wounds, and 6,605 from other illnesses.

Typhus in the Turkish Army.—It is reported that soldiers of the Turkish army in Syria are dying from typhus fever at the rate of 1,000 a day. Cholera is also said to be prevalent. The American Committee for Armenian and Syrian Relief says it will send drugs and chemical supplies to Syria on the Naval Collier *Cæsar*, which will leave New York for Beirut, about December 20.

Hospital Ships Sunk.—The White Star steamship *Britannic*, one of the largest steamships afloat, was sunk in the Aegean Sea, November 22. The *Britannic* was being used as a hospital ship and was carrying many British sick and wounded, of whom 1,106 were saved and about fifty drowned. The ship was sunk by a mine or torpedo.——The British hospital ship *Braemer Castle*, bound from Saloniki to Malta, with wounded, is reported to have been mined or torpedoed in the Aegean Sea, November 24.

Losses in the Medical Force of the Italian Army and Navy.—The *Policlinico* quotes the inspector general of the military medical service to the effect that 68 physicians have been killed in the war in Italy to date and 63 medical students, all while tending the sick and wounded. In addition to this total of 131, there are 45 medical officers known to have been taken prisoners by the enemy. The *Policlinico* adds that its own lists give the number still higher, 84 physicians and 81 medical students, a total of 165.

Southern Serbian Relief Work.—The American Red Cross is preparing to undertake the relief of a number of civilians in Southern Serbia in and about Monastir. A large percentage of the 200,000 civilians in the country recently fought over by the allied troops is in need of assistance. The first shipment of food supplies, amounting to $5,000, has already started from New York, and an additional $5,000 has been cabled to agents at Saloniki for emergency purposes. More supplies will be sent later and the Red Cross staff in Saloniki will be greatly increased.

PARIS LETTER

PARIS, Nov. 9, 1916.

The War

NEW SURGICAL AUTOMOBILE TRAINS

The equipment of the military health service has been considerably improved since the beginning of the war. Adaptation to existing conditions has necessitated considerable reorganization, which has particularly affected automobiles equipped for special work. A recent innovation, worthy of special mention, is the introduction of what are known as complementary surgical groups. Each of these groups is composed of two vehicles—an automobile wagon tractor and a trailer, the object of which is to provide divisional ambulances with complementary means for sterilization, roentgenoscopy, electric light and a portable operation hut. The wagon has a specially constructed body and is divided into two distinct and separate compartments. In front, behind the driver's seat, is the first compartment. It contains a dynamo and its engine to which two flap doors opening on each side give easy access, while at the same time forming a shelter above, and prolongation of the floor below. There is also the necessary apparatus for the protection and control of the roentgeonoscopic installation as well as two cases containing the electrical apparatus. The second and larger compartment contains a roentgenoscopic apparatus on the right hand side, and sterilizers, including an autoclave, a Poupinel sterilizer, a field sterilizer, two kettles of 25 liters each, a Vermorel spray, a drying cupboard for linen, large and small sterilizing boxes and a lavabo on the left hand side. There are also an operating table, four small tables, and a quantity of petroleum, alcohol, formol, etc. The dynamo is a Compound-Thompson giving 2½ kilowatts at 100 volts, continuous current, and, being provided with a very sensitive governor, furnishes uniform illumination. The distribution of the light is effected by flexible conductor bands, along which lamps can be rapidly installed and removed. The small operating hut, carried on the trailer, is formed of double panels, light and interchangeable, and its internal surface is covered with white oilcloth, permitting the maintenance of asepsis by sponging. This hut is composed of two rooms—one serving as a preparation room, and the other as an operating room. The floor is covered with linoleum. It is heated by water at 90 F. circulating through winged tubes from a small, light boiler carried on two wheels. The field armies will be provided with 140 of these complementary surgical automobile trains.

PHYSICAL QUALIFICATION OF CANDIDATES FOR AVIATION SERVICE

The aviation service requires special qualities, not only of courage and endurance, but also of physical fitness. A careful examination, therefore, is made of all candidates. They must have a sound heart, good respiratory capacity, perfect vision, and must show no tendency to vertigo. On the initiative of Dr. Marchoux, a further series of tests has been imposed on candidates to insure the possession of qualities more delicate, yet no less indispensable, which would make certain the functioning of the nervous system of the aviator in a manner as nearly as possible similar to the imperturbable mechanical one of the engine itself. These qualities are the maximum of imperturbability, and the ability to execute instantly—almost mechanically—the maneuvers necessitated by any sudden emergency. Candidates for aviation are therefore subjected to two kinds of tests: The first kind measures the rapidity of perceptions and of the psychomotor reactions which they cause in connection with visual, auditory and tactile impressions. The second kind measures the degree of influence exercised by the emotions on the cardiac and respiratory rhythm, on the muscular contraction of an organ in action (trembling of the hand) and on the blood pressure. For the first series of tests the subject is placed in front of a d'Arsonval electric chronometer. The circuit of the dial is made once a second by a hand which can be started by the examiner whenever he desires, and can be stopped instantly by pressure on a button placed under the finger of the candidate. The operator starts the hand, and the candidate, whose eyes are fixed on the latter, presses the button as soon as he notices the movement. The distance through which the hand has passed gives in hundredths of a second the total length of the various operations estimated by the reaction time of the candidate. In a normal subject this is about 0.19 second; in emotional or hesitating subjects it may rise to 0.3 second, or more. The same method is used to measure the length of

the psychomotor reaction time to auditory impressions (sound of a gong or the blow of a hammer), and to tactile impressions (the shock of a wet cloth on the head or hand). The normal reaction time in this case is from 0.14 to 0.15 second. The examination of the candidate comprises ten experiments for each test, the mean of which is taken for the final result. Thanks to this double series of experiments, the selection of candidates can be made in a very rigorous manner, which is clearly both to their own interest and to that of the service. The number of candidates thus found incapable of serving as pilots is between 30 and 40 per cent. of those applying.

TEST FOR PICRIC ACID IN THE SERUM OF JAUNDICE MALINGERERS

Dr. Castaigne of the Faculté de médecine de Paris, physician of the hospitals, and Dr. Desmoulières have communicated to the Académie de médecine a practical process which permits the prompt detection of false jaundice caused by ingestion of picric acid. For this purpose from 15 to 20 c.c. of the blood of the patient are placed in a test tube, and an equal quantity of an aqueous solution of trichloracetic acid added. The mixture is shaken vigorously and filtered. The filtrate thus obtained is colorless unless picric acid is present, in which case it has a more or less yellow tint. The slightest yellow tinge is sufficient to prove the presence of this acid.

THE DENTAL CONGRESS OF THE ENTENTE ALLIES

The Dental Congress of the allies will open, November 10, in the Dental School of Paris, M. Justin Godart, undersecretary of state of the military health service, presiding. This congress, which has been authorized by the minister of war and which is placed under his patronage as well as under that of the minister of the marine, will be especially devoted to the consideration of war wounds of the jaw and face, of maxillary facial prosthesis, of dentistry, and of the organization of the dental services in the army during and after the war. It is open to all stomatologists and surgeons specializing in this subject who have been accepted by the allies to treat face wounds in their different sanitary corps.

LOSSES IN MILITARY MEDICAL SERVICE

According to the official figures published in the *Bulletin médical*, the total losses of the medicopharmaceutical corps during the war comprise 453 physicians who have died, 285 of whom were killed; 1,350 physicians who were wounded; 24 pharmacists who have died, 3 of whom were killed, and 18 pharmacists who were wounded.

LONDON LETTER

LONDON, Nov. 13, 1916.

Sanatogen Assets Sold by the Government

In a previous letter to THE JOURNAL it was stated that an English firm had put on the market a preparation named sanaphos as a substitute for the German sanatogen, taking advantage of the animosity against everything German provoked by the war. The same boastful claims were made for the new as for the old nostrum. At first the government allowed the sanatogen business to continue under a controller which it appointed so as to prevent any of the profits being transmitted to Germany. The controller, Max Muller, a German and one of the former managers of the business, was allowed to communicate with the proprietor, Wulfing, in Germany, a proposal to sell the business to an English company. Wulfing telegraphed that he agreed to the sale provided he had option to repurchase at the end of the war. The telegram was intercepted by the censor, with the result that the government refused consent to the proposed transfer. Thereafter for a time, apparently, the firm was allowed to continue its business in England. Last May an order was made by the government requiring the business to be wound up, and seven weeks later a notice was issued stating that the controller appointed had decided to sell by tender as a going concern the leases of the premises held by the company near Penzance and in London with the plant and machinery, and that the existing milk contracts and stocks of sanatogen, formamint, etc., would also be disposed of. Nothing more was heard of the matter until toward the end of September, when it was disclosed that sanatogen was still being manufactured and sold by the company, the profits being accumulated and held presumably for the German proprietor, and that efforts were actually being made, by the employment of canvassers and the offer of a bonus, to push the sale of the product. Instructions were then issued by the government to sell the business at the earliest possible moment without any reference to trade marks or goodwill. It is explained that the board of trade had ordered the sale to be postponed owing to uncertainty whether the trade marks should be cancelled or sold with the other assets, and that it had allowed the firm to go on making and selling sanatogen in order that the farmers who supplied skimmed milk to the business should not find their contracts suddenly ended without an apportunity of renewing them with the purchaser of the factory. It was consequently not until September, 1916, nearly twenty-six months after the outbreak of war, that the government gave their final directions for the sale of this German undertaking. It has been purchased by a group of British business men, and the fact is announced in the press as an affair of the first magnitude!

The Problem of Venereal Diseases

As stated before, the problem of venereal diseases has, largely as a result of the war, aroused great attention. The subject has been ventilated in the press in a manner which would have seemed impossible a few years ago. The question of notification has produced an acute controversy. In an address delivered at the Institute of Hygiene, Sir Malcolm Morris said that the problem probably would never have obtained the publicity it had if it were not for the fact that this great war was causing these diseases to spread throughout the country with greater rapidity than normally. What was true now would be more true when the war was over and men came back. That this fear was well grounded was shown by what followed the Crimean and Napoleonic wars. It was because of a "conspiracy of silence" that the disease had spread. That conspiracy had now broken down, and the press of the country had greatly helped to remove it. Under the new regulations, the state was prepared to bear 75 per cent. of the cost of the new treatment. The essence of the success of the movement would be that the treatment would be entirely free. With regard to the proposal of certain women that the disease should be made compulsorily notifiable, he thought it would be of far less value in such cases than it had proved to be in some of the infectious fevers. In venereal disease, isolation was neither necessary nor practicable, and as to disinfection, it was not the surroundings that needed to be disinfected, but the patient, and he or she could be disinfected only by being cured. Notification, in fact, would do little, except furnish statistics of the incidence of venereal disease, while it would excite a great deal of opposition, and would inevitably drive many patients into the hands of quacks. Compulsory treatment, which was demanded by some advocates of notification, was in the present state of public opinion a chimera. The whole weight of expert opinion was against it.

The government scheme for the free treatment of venereal diseases is on the point of being put into effect. The great naval base, Portsmouth, will be the first town in which it will be put into action. The war office is cooperating with the local authorities, and two army surgeons experienced in the work will assist in the local hospital. It was at one time feared that hospitals might object to receiving those living in distant districts, but the response of these institutions goes to show that such fears are groundless. When patients are able to pay for private treatment they will not be encouraged to stay in the hospital, and will be recommended to seek the services of an outside physician. This will go a long way to meet the principal objection urged by the physician to the proposed national scheme. One result of the consultations between the Local Government Board, the councils and the physicians has been to bring home the conviction that the suppression of treatment, now so very general, by quacks and other unqualified persons is essential to the success of the new campaign against these diseases.

The Care of the Child

Mr. Samuel, the home secretary, speaking at a meeting at Oxford arranged by the Oxford Health and Housing Association, outlined a comprehensive scheme of infant welfare, and promised every encouragement from the government for societies engaged in this work. He said that the Local Government Board had recently circularized all the local authorities urging them to support schemes for maternity and infant welfare, and not to regard the ban on local expenditure due to the war as applying in any degree to that branch of their activities. It was one of the finest social successes of which we had any record that our infant mortality had been reduced

by nearly one third in little more than ten years. Two ideas had influenced people of somewhat shallow thought and of pseudoscientific notions. One was that it did not matter how many babies were killed off—it was an example of the working out of the principle of evolution; the fittest survived, and the weakest went to the wall. But the damaged rate was just as important as the death rate, and by getting rid of evil social conditions, which produced weakness, infirmity and disease, a large proportion of children might be successfully reared. The second idea was that the country was overpopulated. But there was no ground whatever for thinking that our population of 45 millions was all that these islands could hold. If we were to deal with the problem of overcrowding in a rational fashion, and spread the people over a larger area, if adequate systems of town planning were pursued still further, and there were an extension of garden cities and garden suburbs, imagination could hardly see the number of persons this country could healthily accommodate. The statistics of antenatal mortality were probably as alarming as any others. It appeared that the deaths before birth were as many as the deaths in the first year of life. Putting the two together, the wastage was not far short of one-third of our potential new population. If these problems could be completely solved, though perhaps it was scarcely possible they should be solved completely, the nation would be much stronger. A complete scheme would consist of several parts and ramifications: first, an arrangement for the local supervision of midwives; second, arrangements for an antenatal clinic for expectant mothers, and a system of visitation; third, a maternity hospital, or beds at an existing hospital, where treatment could be given in complicated cases of pregnancy, and prompt attention could be given for the confinement of sick women, and fourth, postnatal work, arrangements for treatment of complications after birth, systematic advice and treatment for infants, continuance of clinics and dispensaries available for children up to the age when they were entered on the school register, and systematic home visitation of infant children not on the school register. The government was prepared to encourage and subsidize in every way the operations of such societies as those under whose auspices that meeting was held. No form of voluntary work for women (apart from the nursing of our soldiers) was more necessary or more useful than that in which those societies were now engaged.

Sir William Osler, who presided, said that the problem of infant mortality was mixed up with the housing and drink questions. A prospective mother ought not to labor long hours in shop or factory, and he regretted the extent to which nursing mothers went out to work in the north of England. There should be antenatal and maternity clinics, systematic inspection of babies, and a thorough inspection of dairies so as to insure the purity of the milk supply.

Marriages

JAMES ARTHUR PORTER, M.D., Hedrick, Iowa, to Miss Florence Grayce Coates of Clay Township, Grundy County, Iowa, November 16.

ALBERT ROWCLIFFE MOFFIT, M.D., Poughkeepsie, N. Y., to Miss Ella Anfrere Borland of New Hamburg, N. Y., November 18.

WILLIS GRAFTON NEALLEY, M.D., Brooklyn, to Miss Leonora Louise Armstrong of Upper Montclair, N. J., November 11.

JULIAN FAVILLE DUBOIS, M.D., Sauk Centre, Minn., to Miss Katherine Lucile Mattocks of Elgin, Ill., November 30.

WILLIAM HANSFORD TRIPLETT, M.D., Matewan, W. Va., to Miss E. Emma Archer of Baltimore, June 14.

MEREDITH MALLOY, M.D., Des Moines, Iowa, to Miss Mary Stiles Jones of Batavia, Ill., November 11.

WILLIAM JOSEPH TRACY, M.D., to Miss Mary Frances Corran, both of Cornell, N. Y., October 18.

RAYMOND JACK HAUSER, M.D., to Miss Ethel Bodine, both of Danville, Pa., September 15.

AUDREY ORIN BROWN, M.D., to Miss Isabelle Logan, both of Detroit, November 22.

CHARLES D. CAMP, M.D., to Miss Lillian A. Harris, both of Chicago, November 25.

Deaths

Thomas Augustine O'Hare, M.D., Rochester, N. Y.; University of Pennsylvania, Philadelphia, 1875; aged 67; a Fellow of the American Medical Association; formerly president of the Medical Association of the State of New York, Monroe County Medical Society, Rochester Academy of Medicine and Rochester Pathological Society, for many years a member and for the last five years president of the board of managers of the Rochester State Hospital; visiting physician to and president of the medical staff of St. Mary's Hospital, Rochester; died at his home, November 21.

Phaon Hermany, M.D., Mahanoy City, Pa.; New York University, New York, 1863; aged 76; a Fellow of the American Medical Association, and formerly president of the Schuylkill County Medical Society; for more than half a century a practitioner of Mahanoy City and local surgeon to the Lehigh Valley Railroad; for many years deputy coroner of Schuylkill County; died at his home, November 18, from neuritis.

Francis Joseph Keany, M.D., Boston; Harvard Medical School, Boston, 1892; aged 48; a Fellow of the American Medical Association; professor of dermatology of Tufts Medical College, Boston; dermatologist to the Boston City and Carney hospitals; consulting dermatologist to St. Elizabeth's Hospital and a trustee of the City Hospital; city dermatologist; died at his home, November 23, from heart disease.

George Wilkins, M.D., Montreal, Que.; University of Toronto, 1866; M.R.C.S., England, 1871; aged 74; professor of legal medicine and history and later emeritus professor of medical jurisprudence in McGill University, Montreal; medical director of the Sun Life Assurance Company and consulting surgeon to the Montreal General Hospital; died at his home, August 7, from cardiovascular disease.

Oleriannus Alvin Cover, M.D., Seymour, Iowa; Baltimore Medical College, 1893; Jefferson Medical College, 1894; aged 54; a Fellow of the American Medical Association; and a member of the Des Moines Valley Medical Society; local surgeon to Chicago, Milwaukee and St. Paul Railway; while driving over a grade crossing, November 28, was struck by a Rock Island freight train and instantly killed.

Frank S. Clark, M.D., Cleveland; Western Reserve University, Cleveland, 1890; aged 51; a Fellow of the American Medical Association; a specialist in obstetrics and diseases of children; chief of staff of St. Ann's Infant Asylum in Maternity Hospital; lecturer on obstetrics at the Charity Hospital and assistant demonstrator of obstetrics in his alma mater; died at his home, November 23.

Joseph Stafford Horsley, M.D., West Point, Ga.; Medical College of Georgia, Augusta, 1870; aged 73; a Fellow of the American Medical Association; formerly president of the Chattahoochee Valley Medical Association; local surgeon for the Atlanta and West Point Railroad; a practitioner of Trop County for more than forty-five years; died at his home, November 17.

Willoughby Walling, M.D., Chicago; University of Louisville, Ky., 1868; aged 68; a member of the Illinois State Medical Society; United States Consul at Edinburgh, Scotland, from 1885 to 1888; for four years head of a wholesale drug firm in Indianapolis and later a specialist on diseases of the ear, nose and throat; died at his home, November 27, from myocarditis.

Robert Latshaw Walker, M.D., Carnegie, Pa.; University of Pennsylvania, Philadelphia, 1866; aged 78; a member of the Medical Society of the State of Pennsylvania; for more than forty-eight years local surgeon for the Pennsylvania System and for forty years surgeon to the Pennsylvania Lead Company; died at his home, November 19, from pleuropneumonia.

David Byron Todd, M.D., San Francisco; University of Michigan, Ann Arbor, 1871; aged 69; formerly of Washington, D. C.; a veteran of the Civil War; resident physician of the Marine Hospital, San Francisco, for several years; for one term a member of the board of education; died in St. Luke's Hospital, San Francisco, November 20, from diabetes.

Andrew James Park, M.D., Oak Park, Ill.; Harvard Medical School, 1852; aged 90; formerly coroner and superintendent of education of Oxford County, Ont.; later a practitioner of New York and Chicago; well known as an astronomer and physicist; died at the home of his daughter in Oak Park, November 25, from senile debility.

Isaac Newton Cochran, M.D., Delphi, Ind.; University of Michigan, Ann Arbor, 1868; aged 73; formerly a member of the Indiana State Medical Association; a veteran of the Civil War; for four years mayor of Delphi and recently elected coroner of Caroll County; died at the Eastman Hospital, Indianapolis, November 22.

Riland Dillard Berry, M.D., Springfield, Ill.; Medical College of Ohio, Cincinnati, 1879; aged 61; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; for many years a practitioner of Springfield; died at St. John's Hospital of that city, November 3, from cerebral hemorrhage.

Joshua H. Ghessling, M.D., Greensboro, Ga.; Medical College of Georgia, Augusta, 1879; aged 60; a Fellow of the American Medical Association, and formerly president of the Greene County Medical Society; for several terms mayor of Greensboro; died in Grady Hospital, Atlanta, after a surgical operation, November 20.

Alice Mitchell, M.D., Chicago; Women's Medical College of the New York Infirmary for Women and Children, 1885; aged 54; for twenty years a missionary of the Presbyterian Board of Missions at Woodstock, Mussowrie, U. P., India; died in Chicago, November 21, after a thyroidectomy for exophthalmic goiter.

John Frank Kane, M.D., Minooka, Pa.; Georgetown University, Washington, D. C., 1911; aged 32; a member of the Medical Society of the State of Pennsylvania; died in the Mary Kellar Memorial Hospital, South Scranton, Pa., November 20, from intestinal obstruction, several days after a surgical operation.

Thomas Joseph Dunn, M.D., New York; New York University, New York, 1888; aged 52; a Fellow of the American Medical Association; professor of clinical medicine in Fordham University Medical School, and a member of the staffs of the Fordham and St. Lawrence hospitals; died at his home, November 23.

Robert E. Cunningham, M.D., Castille, La.; University of the South, Sewanee, Tenn., 1902; aged 44; formerly a member of the Louisiana State Medical Society; a member of the Acadia Parish board of health and school board; died suddenly at his home, November 11.

John Edwin Walker, M.D., Thomaston, Me.; Medical School of Maine, Brunswick, 1884; aged 58; a member of the Maine Medical Association; physician to the Maine State Prison from 1888 until 1914; died at his home, November 22, from abscess due to a fall.

Frederick James Sanborn, M.D., Spencer, Mass.; Bellevue Hospital Medical College, 1883; aged 55; a member of the Massachusetts Medical Society; died suddenly from heart disease, November 20, in his automobile, while making a professional call.

William Henderson, M.D., Sarnia, Ont.; Trinity Medical College, Toronto, Ont., 1898; aged 45; who had recently returned after a year's active service with the Royal Army Medical Corps, abroad; died at his home, October 25, from angina pectoris.

Gordon Lee Harker, M.D., Parker, Colo.; Medico-Chirurgical College of Philadelphia, 1892; aged 47; for many years a practitioner of New Jersey, but for the last four years a resident of Colorado; died at his home, November 5, from kidney disease.

George Richard Bray, M.D., Fort Recovery, Ohio; Medical College of Ohio, Cincinnati, 1905; aged 52; until last year a practitioner of Dayton, Ky., and Cincinnati; died at the home of his mother in Fort Recovery, August 21, from diabetes.

Francis Adam P. Sieber, M.D., Chicago; Rush Medical College, 1883; aged 75; a veteran of the Schleswig-Holstein and Franco-German wars; once health commissioner of Lake View; died at his home, November 24, from chronic nephritis.

Isaac H. Mayer, M.D., Willow Street, Pa.; Jefferson Medical College, 1859; aged 73; once president of the State Medical Society; president of the state horticultural society, and noted as a fruit grower; died at his home, November 13.

Verne Ernest Winston, M.D., Keystone, S. D.; College of Physicians and Surgeons, Chicago, 1903; aged 37; died in the Methodist Deaconess Hospital, Rapid City, S. D., November 12, a few hours after an operation for appendicitis.

Edwin Hunt Robinson, M.D., Robinson Springs, Ala.; Memphis, Tenn., Medical College, 1849; aged 89; a member of the Medical Association of the State of Alabama until his retirement in 1908; died at his home, November 22.

John George Weinland, M.D., Dallas Center, Iowa; Beaumont Hospital Medical College, St. Louis, 1892; aged 60; a member of the Iowa State Medical Society; died at his home, August 31, from pernicious anemia.

John James Mason, M.D., New York; Bellevue Hospital Medical College, 1869; who retired from active practice in 1880, in New York, to engage in microscopic and anatomic work; died at his home, November 22.

Silas A. Boam, M.D., Topeka, Kan.; College of Physicians and Surgeons, Birmingham, England, 1870; aged 70; for nearly thirty years a practitioner of Topeka; died at his home, November 15, from heart disease.

Thomas W. Smith, M.D., Kiefer, Okla.; Hospital College of Medicine, Louisville, Ky., 1900; aged 42; formerly a Fellow of the American Medical Association; died in a hospital in Tulsa, Okla., November 10.

John Benjamin Joyce, M.D., Masonville, Iowa; Omaha Medical College, 1898; who was adjudged insane in December, 1914; died in Omaha, recently, following an operation for suppurative appendicitis.

George E. Nickel, M.D., Belle Vernon, Pa.; Physio-Medical Institute, Cincinnati, 1881; aged 57; a member of the school board and city council of Belle Vernon; died at his home, November 13.

Gulielmus Law, M.D. (Hon.); Greeley, Colo.; Gross Medical College, Denver, 1889; a practitioner since 1861; aged 78; a Fellow of the American Medical Association; died at his home, November 18.

Edgar Levander Handrick, M.D., Little Meadows, Pa.; Jefferson Medical College, 1863; aged 76; for more than half a century a practitioner of Friendsville, Pa.; died at his home, November 5.

Charles Gray Cole, M.D., Binghamton, N. Y.; Albany (N. Y.) Medical College, 1897; aged 51; a Fellow of the American Medical Association; died at his home, October 27, from pneumonia.

George W. Parr, M.D., Geuda Springs, Kan.; Western Reserve University, Cleveland, 1868; Bellevue Hospital Medical College, 1876; aged 75; died at his home, November 19, from pneumonia.

Oliver Herman Heidt, M.D., Detroit; University of Michigan, Ann Arbor, 1915; aged 26; a Fellow of the American Medical Association; died in Harper Hospital, Detroit, November 23.

John A. Warner, M.D., Clarksville, Mich.; Saginaw Valley Medical College, Saginaw, Mich., 1901; Detroit College of Medicine and Surgery, 1908; aged 51; died in Chicago, November 5.

James Oscar Green, M.D., Long Branch, N. J.; Bellevue Hospital Medical College, 1866; aged 76; a lifelong resident of Long Branch; died at his home, November 24, from pneumonia.

Charles C. Dransfeld, M.D., San Francisco; St. Louis College of Physicians and Surgeons, 1883; died in the Buena Vista Sanatorium, San Francisco, November 13, from myocarditis.

Samuel Erskine McClymonds, M.D., College Springs, Iowa; Miami Medical College, Cincinnati, 1877; aged 64; a member of the Iowa State Medical Society; died at his home, November 17.

David Claytor, Bedford, Va. (license, Virginia); aged 84; for nearly half a century a practitioner of Virginia; a Confederate veteran; died at his home near Bedford, November 17.

Jesse M. Ledbetter, M.D., Shreveport, La.; Charity Hospital Medical College, New Orleans, 1876; aged 62; formerly a member of the city council; died at his home, November 9.

Onas Smith, M.D., Ash Grove, Mo.; St. Louis College of Physicians and Surgeons, 1904; aged 33; also a druggist; died at his home, November 15, after a surgical operation.

James M. Evans, M.D., Clarksburg, Ohio; Starling Medical College, Columbus, Ohio, 1850;; aged 91; a life-long resident of Clarksburg; died at his home, November 15.

John H. Penn, M.D., Ravenna, Neb.; Ensworth Medical College, St. Joseph, Mo., 1893; died in a hospital in Omaha, November 11, after a surgical operation.

Jesse K. Bailey, M.D., Dayton, Ohio; Ohio Medical University, Columbus, 1894; aged 65; died at his home, November 14, from cerebral hemorrhage.

W. M. Sineath, Tifton, Ga. (license, Georgia, 1897); died, about November 3.

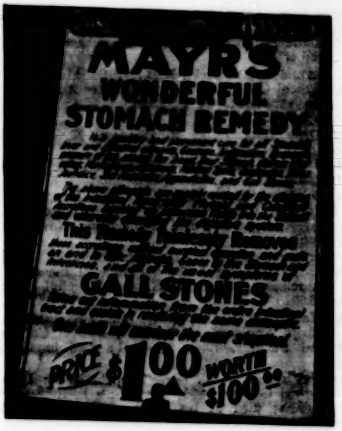
The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

MAYR'S WONDERFUL STOMACH REMEDY

An Illustration of One Weakness of the Food and Drugs Act

"Mayr's Wonderful Stomach Remedy" has been discussed at some length before in THE JOURNAL[1] and it is not necessary at this time to go into any elaborate details regarding its composition. To refresh the memory of our readers, suffice to say the nostrum is essentially a large dose of fatty oil followed by a saline cathartic (Epsom salt, Rochelle salt, etc.). As is well known, when a large dose of bland oil is taken, followed by a saline, greenish soapy concretions are passed which the layman is invited to believe are "gallstones." The fake-gallstone trick was long a favorite of the traveling quacks; certain "patent medicine" makers have not been above adapting the same scheme to their business.



Photographic reproduction (reduced) of one of the window display cards exhibited in one of George H. Mayr's own stores in October, 1916. Several of the claims made on this card were admitted by Mayr to be false and fraudulent, when he was haled into the federal court for making them on the trade package. Nearly a year after admitting their falsity and fraud Mayr was still making them in his store windows—over which the federal law has no jurisdiction.

The reason for again referring to Mayr's Wonderful Stomach Remedy is to bring home one of the weaknesses of the federal Food and Drugs Act. Attention was recently[2] called to the fact that while it was more or less risky for "patent medicine" exploiters to make false and fraudulent curative claims on the trade packages, there was nothing to prevent false and fraudulent claims from being made for these same medicines through any other avenue of publicity which the nostrum maker might employ. Based on this, THE JOURNAL offered this rule for the detection of presumptive fraud: Any statement regarding the curative effects of a "patent medicine" that appears in any newspaper advertisement, circular, window display, etc., but does not appear on the trade package, may logically be regarded as false and fraudulent.

1. The matter is reprinted, with illustrations, in the pamphlet "Miscellaneous Nostrums," price 10 cents.

2. Patent Medicine Advertising in Newspapers and On the Trade Package, editorial, THE JOURNAL A. M. A., Nov. 25, 1916.

Mayr's Wonderful Stomach Remedy is again referred to point a moral and adorn a tale. In the free and easy days before there was any Food and Drugs Act, the Mayr product was sold frankly as a "cure" for gallstones. The label blatantly and unblushingly proclaimed the falsehood: "It Removes Gall Stones and Shows Them to You." After "morality by act of Congress" became, within circumscribed limits, an accomplished fact, this particular untruth disappeared from the label of the Mayr remedy. Then came a period in which gaudy window displays were used and in large letters that could be read across the street, one read:

"MAYR'S WONDERFUL STOMACH REMEDY REMOVES GALL STONES, CURES APPENDICITIS, CURES ALL STOMACH, LIVER AND INTESTINAL AILMENTS. ENTIRELY HARMLESS."

A closer study of the display showed that between the words "Removes" and "Gallstones" there were printed in small letters and in colors that made them well nigh invisible, the words, "symptoms of." Similarly, also in small letters and not easily distinguishable, the word "chronic" was sandwiched in between "Cures" and "Appendicitis."

But although Mayr had deleted from his label the frank claim that his nostrum "removes gall stones and shows them to you" he still continued to make statements on the trade package that were false. Then the federal authorities took a hand and information was filed against George H. Mayr of Chicago alleging that his nostrum was misbranded under the Sherley Amendment to the federal Food and Drugs Act. The government declared that certain statements on the trade package, which are quoted at length in the report, were "false and fraudulent," in that these curative claims had been "applied to the article knowingly and in reckless and wanton disregard of their truth or falsity." The officials declared further that these claims were made

Photographic reproduction (reduced) of part of a carton of Mayr's Stomach Remedy used before the days of the Food and Drugs Act. The falsehood, that it would "cure" gallstones, no longer appears on the trade packages. More than ten years after the passage of the Food and Drugs Act it continued to appear in window displays which are not subject to the penalties of the federal law.

"so as to represent falsely and fraudulently to the purchasers thereof, and create in the minds of purchasers thereof the impression and belief, that it was, in whole or in part, composed of, or contained, ingredients or medicinal agents effective, among other things, when taken in connection with Mayr's System Regulator and Tonic, as a remedy for gastritis, appendicitis, and gall stones, in taking out inflammation from the entire intestinal tract and rendering the same antiseptic, as a cure for gall stones of the liver, as a positive remedy and cure for appendicitis, and as a positive remedy for all stomach, liver, and intestinal diseases, when, in truth and in fact, it was not, in whole or in part, composed of, and did not contain, such ingredients or medicinal agents."

Photographic reproduction of a large permanent window sign still displayed at one of Mayr's Chicago stores. The federal law has no jurisdiction over claims made under these conditions!

Denuded of its legal verbiage this means that Mayr's claims that his nostrum was a "cure" for gallstones, appendicitis

and all stomach, liver and intestinal diseases were false and fraudulent!

What did George H. Mayr do when confronted with this charge? Did he attempt to justify the claims under which he had been obtaining the public's money? Did he bring evidence to attempt to establish the claims that his remedy would cure gallstones and was a positive remedy for all stomach, liver and intestinal diseases? Not at all. George H. Mayr pleaded guilty.

He pleaded guilty, Dec. 10, 1915. Nearly a year later, George H. Mayr was still displaying, in the windows of his stores in Chicago, large placards containing not only some of the same claims that he had admitted in the federal courts were false and fraudulent and made knowingly and in reckless and wanton disregard of their truth, but even more positive claims. We reproduce a photograph of one of these cards, cards, by the way, which in the original stood half the height of a man. We would further call attention to the fact that at the time this article is printed (Dec. 7, 1916) George H. Mayr still has painted in large letters over the top of his store window the following legend:

"Mayr's Wonderful Stomach Remedy is the Only Known Cure For All Stomach, Liver and Intestinal Complaints. One Dose will Prove It."

Photographic reproduction of a portion of a window display used by the Mayr concern. The original (which was about two feet long) of the portion here reproduced was a gaudy affair of red, green, blue, yellow, black and gilt. The color effect was such as to make the words "symptoms of" and "chronic" within the circles almost unreadable at a slight distance, the letters being small and in black on a dark red background. The words "removes gallstones" and "cures appendicitis" were in large white letters that could easily be read across the street.

It is justifiable to assume that when any man, whatever his business, admits in court that he has made fraudulent claims and then continues to make the same claims through channels that are not controlled by penal enactment, that man's standard of business ethics is such that the public needs protection against it. There are many such men in the "patent medicine" world. The only way in which the public may properly be protected against being defrauded in such cases is for the federal Food and Drugs Act to have its scope extended to cover *all* advertising of the products coming under the purview of the act.

One further thought. The Mayr nostrum is another explanation for the frantic objections of the "patent medicine" interests to giving the public the facts regarding the composition of their preparations. How many people would pay a dollar a package for "Mayr's Wonderful Stomach Remedy"—the "Only Known Cure For All Stomach, Liver and Intestinal Complaints"—if they knew that it was essentially nothing more "wonderful" than a small bottle of olive oil and a dose of Epsom salt?

MORE MISBRANDED NOSTRUMS

E. K. THOMPSON'S BAROSMA COMPOUND

"E. K. Thompson's Barosma Compound" which, according to the label contained 25 per cent. grain alcohol (about one half the strength of raw whisky) was put on the market by the Thompson Medical Company, Titusville, Pa. The preparation was analyzed by the federal chemists, who reported that the product was a watery-alcoholic solution containing bromid of potassium (3.85 per cent.), potassium acetate (2.6 per cent.), extract of buchu and sugar (18.4 per cent.). The stuff was sold under the inferential claim that it was a cure for Bright's disease and other inflammations of the kidneys and under such specific claims as:

"A remedy for Chronic or Acute Inflammation of the Kidneys or Bladder and Ulceration of the same, Gravel or Stone in Bladder, Rheumatism, Sciatica . . . and Dropsy."

"Is a Splendid Remedy for . . . Rheumatism, Sciatica."

These and other statements the federal officials charged were "false and fraudulent" and made "knowingly and in reckless and wanton disregard of their truth or falsity." The company would neither affirm nor deny the charges, but entered a plea of *nolo contendere* and the court imposed a fine of $10 and costs.—[*Notice of Judgment No. 4114.*]

SAYMAN'S VEGETABLE LINIMENT COMPOUND

"Sayman's Vegetable Liniment Compound" was prepared and sold by one Thomas M. Sayman, St. Louis. Some of the claims made for it were:

"This preparation is a valuable remedy for the treatment of the following disease: . . . Deafness . . . Fever and Ague, Congestive chills."

"This preparation is a valuable remedy for the treatment of the following diseases: Rheumatism . . . Croup, Whooping Cough, Diphtheria. . . . Inflammation of the kidneys . . . Dysentery, Bloody Flux . . . Goiter . . ."

In addition, it was recommended for bites from rabid dogs, painful menstruation, granulated eyelids, sore nipples, toothache and chilblains. The chemists of the department reported that analysis "showed the product to be essentially a hydro-alcoholic solution of camphor, chloroform, capsicum, oil sassafras, ammonia and plant extractive; it contained 62.0 per cent. by volume of alcohol, and 18.85 minims per fluid-ounce of chloroform; the presence of turpentine was indicated." The therapeutic claims made for the stuff were declared false and fraudulent. Sayman pleaded guilty and was fined $50 and costs.—[*Notice of Judgment No. 4128.*]

GREEN DROPS

"Knorr's Genuine Hien Fong Essence or Green Drops" was manufactured by Herman and Emil Knorr of Detroit, doing business under the name Knorr Medical Company. The government chemists reported that analysis of the product showed it to contain:

Alcohol (by volume)	69.72 per cent.
Ether (by volume)	0.35 per cent.
Nonvolatile matter per 100 c.c.	0.28 grams

Flavored with oil of spearmint.

Some of the claims made for this preparation were:

"An excellent Remedy for diseases of the Stomach, and Bowels, Colic, Cholera Morbus, Summer Complaint, Neuralgia, Catarrh, Colds, Tonsillitis, Sore Throat, Croup and Diphtheria."

"Dullness of ears, and even deafness, has been relieved and benefited by wearing a little wadding moistened with the Essence in the ear."

These and similar claims the government declared to be false and fraudulent and made knowingly and in reckless and wanton disregard of their truth or falsity. Herman and Emil Knorr pleaded guilty and were fined $50.—[*Notice of Judgment No. 4116.*]

Correspondence

Martin I. Wilbert — An Appreciation

To the Editor:—In the death of Martin I. Wilbert, Phar.D., the medical and pharmaceutic professions have lost a most useful and effective member. His long practical experience in the various branches of pharmacy, added to a broad theoretical knowledge of the subject, and his close affiliation with the medical profession made him exceptionally valuable.

The range of Dr. Wilbert's information was truly remarkable. For example, he was in constant demand as a consultant on various features of the Harrison Narcotic Law, a subject on which he probably was better informed than any other man. Possibly no man in this country had a wider, more intimate and more comprehensive knowledge of the pharmacopeias of the world than he did. He could be depended on for most valuable suggestions and counsel in connection with any subject in relation to his work. Indeed, I do not recall ever having carried any problem to Dr. Wilbert without having received help in unstinted measure.

I think I should mention his self-eliminating helpfulness; he never exploited himself, nor would he allow others to do so. His aim was the good of the cause in which he labored and, this accomplished, he sought no credit for his own share therein. He frequently carried the burdens of others without showing his own hand. His originality and clear headed foresight in outlining problems and suggesting methods and means for their solution did credit to his middle name, Inventius; and he was never too busy to "help out."

MARTIN I. WILBERT, PHAR.D., 1865-1916.

Dr. Wilbert's work at the Hygienic Laboratory covered a period of about eight years. During this time he was engaged in the work of the Digest of Comments on the Pharmacopeia and allied subjects, and made numerous contributions to medical and pharmaceutic literature. In this and, in fact, in all that he undertook he worked harder than any man should work, and within a month before his death he had been admonished to take things a trifle easier; but he could not "let up." He had to work at full pressure in spite of a bodily handicap that would have immobilized the average man.

His loss will be severely felt at the Hygienic Laboratory, and the individual members of the staff have lost a dear and valued friend and counselor.

G. W. McCoy, M.D., Washington, D. C.
Director, Hygienic Laboratory.

Spirochaeta Pallida or Treponema Pallidum?

To the Editor:—Your editorial comment on this question (THE JOURNAL, Nov. 25, 1916, p. 1607) is in error. Schaudinn originally placed the *Treponema pallidum* in the genus *Spirochaeta*. It was only after he discovered that it did not belong to that genus that he named a new genus, *Treponema*. Both your editorial writer and Dr. Pusey should familiarize themselves with the rules of zoological nomenclature as laid down by the International Committee. Dr. Charles Stiles, Washington, D. C., is the secretary of that committee. It is not a matter of sentiment that makes us prefer the term *Treponema pallidum*, but a matter of scientific nomenclature. If you discovered a new organism and named it by a term used previously by zoologists to designate an entirely different organism, the name would not stand in zoological nomenclature, and either you or some successor would have a right to give it an entirely new name. I suggest that you write to Dr. Stiles, care Public Health Service, and get a copy of the rules for zoological nomenclature and publish them, because they will inform your readers in a way that Dr. Pusey's article and your editorial comment do not.

OTTO V. HUFFMAN, M.D., Brooklyn.

[Dr. Huffman's letter was referred to Dr. Pusey, who says:]

To the Editor:—Dr. Huffman's sweeping condemnation of the editor and me for being in error is so broad that in general it is probably true. We are doubtless in error about a good many things. But specifically as applied to the facts in my letter, I imagine the question is open to more discussion than his cocksureness would indicate. The facts about the classification of the organism of syphilis are pretty fully answered in my article, particularly in the quotation from Metchnikoff. In my argument for the use of *Spirochaeta pallida*, however, I am not concerned about the classification of the organism. If Schaudinn was uncertain about its classification—and he undoubtedly was—the present opinions about its classification are not an argument so overpowering that they will force the change of a name which is now in almost universal usage. I am not in error in the citations of usage which I give in my article—in saying, for example, that most of the great men in syphilis use *Spirochaeta pallida*. If Dr. Huffman, in saying that the editor and I are in error, means to include Ehrlich, Metchnikoff, Hoffmann, Neisser and Uhlenhuth with the editor and me in this error, I am willing to accept without further argument his ex cathedra condemnation.

W. A. PUSEY, M.D., Chicago.

The Marketing of Arsenobenzol

[The following letter from Dr. Schamberg was written in reply to a letter asking if it would not be possible for him again to supply arsenobenzol. While the letter was not originally written for publication, Dr. Schamberg has given us permission so to print it. See pages 1756-1757.—ED.]

To the Editor:—I beg to acknowledge receipt of your letter of November 8. I am fully in sympathy with your attitude and with that of the medical profession and the public as regards the salvarsan situation. Drs. Raiziss, Kolmer and myself have received numerous letters and requests from physicians and hospitals urging us to go on with the preparation and marketing of arsenobenzol. It must be remembered that the United States government has granted most comprehensive patents on this drug and its congeners.

During the period when salvarsan could not be obtained in this country, we prepared and distributed arsenobenzol, after informing the American licensees of the Farbwerke-Hoechst Company of Frankfurt, Germany, of our intention to do so. The American representative, Mr. Herman A. Metz of New York, said that he would not, on humanitarian grounds, interfere with our supplying the drug as long as he could not obtain the German product, but that when salvarsan was again restored to the American market, he would bring suit for infringement of patents, if we did not then cease the distribution of the drug. Salvarsan is protected by both product and process patents; even though we proved that our

drug were biologically different from salvarsan, it would be incumbent on us to demonstrate likewise that in the preparation of arsenobenzol we had not in any manner utilized any of the processes which were patented by Ehrlich.

We have consulted eminent legal counsel and we have been advised that even if it could be proved that our product were 100 times superior to salvarsan, this would not give us any right to market the same if we in any manner infringed on the process patents. The question of infringement of patents would of course have to be ultimately passed on by the court in the event of litigation.

If the marketing of arsenobenzol were a business venture with us, I am free to admit that we would not have ceased its preparation and sale on the resumption of the supply of salvarsan to this country. Our laboratories, however, were primarily organized for scientific research and we were fortunate to be able to step into the breach and supply physicians of this country with arsenobenzol during the period of six months when salvarsan could not be obtained. Having served this purpose in the interests of humanity and the public health, we ceased the marketing of the drug after the German product was forwarded to this country in sufficient quantity for its needs. It is obvious that I could not afford to embroil our laboratories in a protracted and expensive litigation and thus divert our activities from the purposes for which the laboratories were instituted.

We are now working on a series of new compounds both of the arsenobenzol and mercurial series, and we are hopeful that in the not distant future we may be able to prepare something of distinct value.

JAY FRANK SCHAMBERG, M.D., Philadelphia.

Carrel-Dakin Solution

To the Editor:—I have just read in THE JOURNAL, Oct. 7, 1916, p. 1108, a short note about the formula for Dakin's solution. I believe that the answer will not allow your reader to obtain the proper kind of solution. Therefore, I take pleasure in sending you the description of the technic which is used in my hospital for the making of the solution.

A. CARREL, M.D.,
Hôpital Temporaire 21, Rond-Royal, Compiègne, France.

PREPARATION OF DAKIN'S SOLUTION (DAUFRESNE'S TECHNIC)

Dakin's solution is a solution of sodium hypochlorite for surgical use, the characteristics of which, established after numerous tests and a long practical experience, are as follows:

(*a*) *Complete Absence of Caustic Alkali.*—The absolute necessity for employing in the treatment of wounds a solution free from alkali hydroxid excludes the commercial Javel water, Labarraque's solution, and all the solutions prepared by any other procedure than the following:

(*b*) *Concentration.*—The concentration of sodium hypochlorite must be exactly between 0.45 and 0.50 per cent. Below 0.45 per cent. of hypochlorite the solution is not sufficiently active; above 0.50 per cent. it becomes irritating.

Chemicals Required for the Preparation.—Three chemical substances are indispensable to Dakin's solution: chlorinated lime, anhydrous sodium carbonate and sodium bicarbonate. Among these three products the latter two are of a practically adequate constancy, but this is not the case with the first. Its content in active chlorin (decoloring chlorin) varies within wide limits, and it is absolutely indispensable to titrate it before using it.

Titration of the Chlorinated Lime.—There must be on hand for this special purpose:

A 25 c.c. buret graduated in 0.1 c.c.
A pipet gaged for 10 c.c.
A decinormal solution of sodium thiosulphate (hyposulphite).

This decinormal solution of sodium thiosulphate can be obtained in the market; it can also be prepared by dissolving 25 gm. of pure crystalline sodium thiosulphate in 1 liter of distilled water, and verifying by the decoloration of an equal volume of the decinormal solution of iodin by this solution. The iodin is prepared by disolving 1.27 gm. iodin and 5 gm. potassium iodid in 100 c.c. of water.

The material for the dosage thus provided, a sample of the provision of chlorinated lime on hand is taken up either with a special sound or in small quantities from the mass which then are carefully mixed.

Weigh out 20 gm. of this average sample, mix it as completely as possible with 1 liter of ordinary water, and leave it in contact for a few hours, agitating it from time to time. Filter.

Measure exactly with the gaged pipet 10 c.c. of the clear fluid; add to it 20 c.c. of a 1: 10 solution of potassium iodid and 2 c.c. of acetic or hydrochloric acid. Drop, a drop at a time, into this mixture a decinormal solution of sodium thiosulphate until decoloration is complete.

The number of cubic centimeters of the hypochlorite solution required for complete decoloration, multiplied by 1.775, gives the weight of the active chlorin contained in 100 gm. of the chlorinated lime.

This figure being known, it is applied to the accompanying table, which will give the quantities of chlorinated lime, of sodium carbonate and of sodium bicarbonate which are to be employed to prepare 10 liters of Dakin's solution.

QUANTITIES OF INGREDIENTS FOR TEN LITERS OF DAKIN'S SOLUTION

Titer of Chlorinated Lime	Chlorinated Lime, Gm.	Anhydrous Sodium Carbonate, Gm.	Sodium Bicarbonate, Gm.
20	230	115	96
21	220	110	92
22	210	105	88
23	200	100	84
24	192	96	80
25	184	92	76
26	177	89	72
27	170	85	70
28	164	82	68
29	159	80	66
30	154	77	64
31	148	74	62
32	144	72	60
33	140	70	59
34	135	68	57
35	132	66	55
36	128	64	53
37	124	62	52

Example: If it required 16.6 c.c of the decinormal solution of the sodium thiosulphate for complete decoloration, the titer of the chlorinated lime in active chlorin is:

$$16.6 \times 1.775 = 29.7 \text{ per cent.}$$

The quantities to be employed to prepare 10 liters of the solution will be in this case:

Chlorinated lime	154 gm.
Dry sodium carbonate	77 gm.
Sodium bicarbonate	62 gm.

If crystalline sodium carbonate is being used, then instead of the 80 gm. of dry carbonate it must be replaced by:

Crystalline sodium carbonate	220 gm.

Preparation of Dakin's Solution.—To prepare 10 liters of the solution:

1. Weigh exactly the quantities of chlorinated lime, sodium carbonate and sodium bicarbonate which have been determined in the course of the preceding trial.

2. Place in a 12-liter jar the chlorinated lime and 5 liters of ordinary water, agitate vigorously for a few minutes, and leave in contact for from six to twelve hours, over night, for instance.

3. At the same time dissolve, cold, in the five other liters of water the sodium carbonate and the bicarbonate.

4. Pour all at once the solution of the sodium salts into the jar containing the maceration of chlorinated lime, agitate vigorously for a few moments, and leave it quiet to permit the calcium carbonate to settle as it forms. At the end of half an hour, siphon the liquid and filter it through double paper to obtain an entirely limpid product, which must be protected from light.

Light, in fact, alters quite rapidly solutions of hypochlorite, and it is indispensable to protect from its action the solutions which are to be preserved. The best way to realize these conditions is to keep the finished fluid in large wicker-covered demijohns of black glass.

Titration of Dakin's Solution.—It is a wise precaution to verify, from time to time, the titer of the solution. This titration utilizes the same material and the same chemical substances as are used to determine the active chlorin in the chlorinated lime:

Measure out 10 c.c. of the solution, add 20 c.c. of 1:10 solution of potassium iodid, and 2 c.c. of acetic or hydrochloric acid. Drop, a drop at a time, into this mixture a decinormal solution of sodium thiosulphate until decoloration is complete.

The number of cubic centimeters employed multiplied by 0.03725 will give the weight of the sodium hypochlorite contained in 100 c.c. of the solution.

A solution is correct when, under the conditions given above, from 12 to 13 c.c. of decinormal thiosulphate are required to complete the decoloration:

$$13 \times 0.03725 = 0.485 \text{ per cent. of NaOCl}$$

The Test for the Alkalinity of Dakin's Solution.—It is easy to differentiate the solution obtained by this procedure from the commercial hypochlorites and from Labarraque's solution:

Pour into a glass about 20 c.c. of the fluid, and drop on the surface a few centigrams of phenolphthalein in powdered form. Dakin's solution, correctly prepared, gives absolutely no change in tint, while in the same conditions Javel water and Labarraque's fluid give an intense red coloration which indicates in the latter two solutions the presence of free caustic sodium.

Apparatus Required for Sterilization of Wounds.—1. One liter bottles, the lower opening with an interior diameter of 7 mm.

2. Distributing tubes with one, two, three or four branches (Gentile).

3. Connecting tubes: (*a*) cylindric tubes, 2.5 cm. long, interior diameter 4 mm.; (*b*) cylindric tubes, 4 cm. long, interior diameter, 7 mm.; (*c*) Y tubes, interior diameter, 7 mm.

4. Mohr pinch-cocks.

5. Irrigating tubes. Drain tubes No. 30 (interior diameter, 7 mm.).
6. Connecting tubes. Drain tubes No. 16 (interior diameter, 4 mm.), closed at one end. Above this end these tubes are perforated with holes from 0.5 to 1 mm. in diameter:

(a) Tubes perforated for 5 cm., 30 cm. long; (b) Tubes perforated for 10 cm., 30 cm. long; (c) Tubes perforated for 15 cm., 40 cm. long; (d) Tubes perforated for 20 cm., 40 cm. long.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

DUNCAN'S AUTOTHERAPY

To the Editor:—I have recently received through the mail a set of reprints from several of the leading medical journals of America (The Journal excepted) on the subject of autotherapy. These reprints include the *American Journal of Surgery*, October, 1913; the *American Practitioner*, July, 1913; the *Medical Record*, date not given; *American Medicine*, Vol. X, No. 10, pages 772-776, October, 1915, and others.

In them the author, Charles H. Duncan, M.D. of New York, claims to have had great success in treating wounds and other surgical conditions by a startling new method. This method consists of injecting hypodermically, or giving by mouth, material collected from the wound and passed through a filter. If these claims are true and if the filtering process is practicable and not too expensive, autotherapy ought to revolutionize my work. I cannot help wondering, however, why I have not seen anything of it in The Journal of the American Medical Association. Would such a method be dangerous, and are Dr. Duncan's claims unfounded?

Charles D. Leach, M.D.,
Huchow Union Hospital, Huchow, Chehkiang, China.

Answer.—No satisfactory evidence has been produced to substantiate the claims made in favor of the treatment called "autotherapy." The hypodermic injection of purulent material filtered absolutely free from bacteria would not cause infection, provided aseptic precautions were observed, but there might be serious danger of acute intoxication from the introduction of poisonous protein products. Although this is a modified form of autogenous vaccine therapy, it is incapable of any form of standardization. The introduction of infectious material into the mouth for curative purposes, although also a kind of treatment with autogenous vaccines, does not permit standardization for many reasons, but especially because so much of the vaccinating material introduced in this way would be digested and rendered inert in the stomach. Neither method is at present of any practical value, nor are they apparently endowed with any miraculous curative properties.

The latest contribution of Dr. Duncan is to the effect that the male spermatozoa and the secretions of the vaginal tract when "injected subcutaneously" or "otherwise absorbed" by the opposite sex "act as a powerful aphrodisiac."

CHOLESTERIN INJECTION TO REENFORCE THE NATURAL MEANS OF DEFENSE

To the Editor:—In The Journal, Nov. 11, 1916, p. 1478, in an abstract of an article by Barbary in the *Bulletin de l'Academie de médecine*, there is described a mixture of cholesterin, camphor, strychnin sulphate and olive oil. Could you give me some more information concerning this; whether the amounts given are for a single dose; the frequency of the dose, and the manner of administration?

Elmer E. McKee, M.D., Reading, Pa.

Answer.—The following is a translation of that part of Barbary's communication relating to the technic:

The preparation finally adopted after numerous trials contains 20 cg. of pure cholesterin, 50 cg. of camphor, and 0.5 mg. of strychnin sulphate for one ampule of 5 gm. olive oil washed in alcohol and sterilized.

1. The cholesterin must be chemically pure. 2. The solvent, pure olive oil, must be washed and rewashed in 90 per cent. alcohol.

The solution, even in large doses, is not toxic.

In men severely wounded we inject from one to three ampules, that is, from 5 to 15 gm. every twenty-four hours. As soon as the lowering of the temperature shows that the infection is diminishing in intensity, one ampule is injected daily; later, injections at intervals of ten days.

In case of operations, we make one or two injections the day before and the day of the operation, following with the injections in series.

In convalescents, a daily injection at intervals of ten days.

This method of rousing the defense of the infected organism after extensive wounds, in the sick, in those exhausted from the stress of war, is extremely simple as it is reduced to injections of 5 gm. of fluid under the rules of ordinary asepsis, which can be done at all places, under all circumstances.

THE FRATERNAL PHYSICIAN SCHEME

To the Editor:—I was fooled, and I wish to save others from the same fate. A man came to me two weeks ago posing as Mr. B——, an organizer of societies. At present he is organizing a branch of the "Protective and Benevolent Order of Beavers" of New York. He produced credentials which seemed to prove absolutely that he was on the level, and no one could doubt his word after reading them. I was supposed to join this branch as physician, as many others have done through his clever ruse. This Mr. B—— takes any amount given, although the initiation fee, as stated on the enclosed card, is $5. Kindly publish this in The Journal, as I am sure it will save other young physicians from falling his prey.

B. B. Pitt, M.D., Brooklyn.

THE RECTAL TUBE AND HIGH INJECTIONS

To the Editor:—The sigmoid flexure can certainly be passed with a rectal tube (The Journal, Dec. 2, 1916, p. 1688) if the patient is placed in the knee-chest position, the tube inserted into the rectum, and the fluid allowed to flow gradually till the rectum is filled. The tube can then be caused to pass the flexure. By no other means can it be prevented from doubling up.

L. E. Barton, M.D., Malta, Ill.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

Alabama: Montgomery, Jan. 9. Chairman, Dr. W. H. Sanders, Montgomery.

Alaska: Juneau, Jan. 3. Sec., Dr. H. C. DeVighne, Juneau.

Arizona: Phoenix, Jan. 2. Sec., John Wix Thomas, 306 Goodrich Bldg., Phoenix.

California: Sacramento, Jan. 9. Sec., Dr. C. B. Pinkham, Forum Bldg., Sacramento.

Colorado: Denver, Jan. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

Delaware: Dover and Wilmington, Dec. 12-14. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

District of Columbia: Washington, Jan. 9. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

Indiana: Indianapolis, Jan. 9-11. Sec., Dr. W. T. Gott, 120 State House, Indianapolis.

Kentucky: Louisville, Dec. 11-13. Sec., Dr. A. T. McCormack, Bowling Green.

Maryland: Regular, Baltimore, Dec. 12. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

Minnesota: Minneapolis, Jan. 2-5. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

Missouri: St. Louis, Dec. 11-13. Sec., Dr. J. A. B. Adcock, Jefferson City.

New Hampshire: Concord, Dec. 18-19. Sec., Dr. W. T. Crosby, Beacon Bldg., Manchester.

New Mexico: Santa Fe, Jan. 8. Sec., Dr. W. E. Kaser, East Las Vegas.

North Dakota: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

Oklahoma: Oklahoma City, Jan. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

Oregon: Portland, Jan. 2. Sec., Dr. Herbert S. Nichols, 802 Corbett Bldg., Portland.

Pennsylvania: Philadelphia, Jan. 9-11. Sec., Nathan C. Schaeffer, Capitol Bldg., Harrisburg.

Rhode Island: Providence, Jan. 4-5. Sec., Dr. C. T. Swarts, State House, Providence.

South Dakota: Pierre, Jan. 10. Sec., Dr. P. B. Jenkins, Waubay.

Virginia: Richmond, Dec. 12-13. Sec., Dr. J. N. Barney, Fredericksburg.

Washington: Spokane, Jan. 2. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

Wisconsin: Madison, Jan. 9-11. Sec., Dr. John M. Dodd, 220 E. 2nd St., Ashland.

Report of First Examination of the National Board of Medical Examiners

As already stated in The Journal (General News, Nov. 18, 1916, page 1534) the first examination of the National Board of Medical Examiners was held in Washington, D. C., Oct. 16-21, 1916. Of the thirty-two physicians who applied for the examination, only sixteen were found to have the essential preliminary and medical qualifications, and only ten of these appeared for the examination. Of the ten, three had not served the entire year required as an intern in a hospital or laboratory, but were admitted to the examination with the understanding that should they pass, the certificate would be withheld until the hospital year had been completed. Two were applicants for admission to the Army Medical Service.

The subjects of the examination and the relative value of each were: anatomy, 100; physiology, 75; chemistry and physics, 75; pathology and bacteriology, 100; materia medica, pharmacology and therapeutics, 75; medicine, 200; surgery, 200; obstetrics and gynecology, 100; hygiene and sanitation,

50; medical jurisprudence, 25. A percentage of 75 was required to pass. Falling below 65 in more than two subjects, or below 50 in more than one subject, constituted a failure. The following colleges were represented:

College	PASSED	Year of Grad.
Rush Medical College		1911
Rush Medical College		1907
Johns Hopkins University		1915
Johns Hopkins University		1916
University of Michigan		1915

College	FAILED	Year of Grad.
Howard University		(1912)
Rush Medical College		(1914) (1915)
Johns Hopkins University		(1916)
University and Bellevue Hosp. Med. College		(1916)

AVERAGES OBTAINED

Subjects	Candidates by Number										General Aver. by Subject
	1	2	3	4	5	6	7	8	9	10	
Anatomy	63	69	84	70	87	95	70	78	64	55	73.5
Chemistry and physics	84	84	84	76	88	82.6	82.4	92	82.4	86	78.1
Physiology	74	82.5	85	85	87.5	82	90	79.5	79	81	80
Pathology	66	52	58	10	92	88	74	68	62	60	71
Bacteriology	50	82	75	81	79	75	75	63	70	70	69
Pharmacology, materia medica and therapeutics	84	80	88	84	84	86.6	96	88	81.5	90	86.2
Medicine	57	54	77	76	88	53	88	83	75	82	73.4
Surgery	58	53.5	80	77.5	73	78	68	78	62	61	68.9
Obstetrics and gynecology	85	67	77	82	66	70	68	80	75	70	74
Hygiene	69	68	72.3	73.3	73.3	66.6	65.6	71.6	65.8	69	69.6
Medical jurisprudence	58	55	80	75	80	70	63	75	88	75	71.7
Eye, ear, nose and throat	60	65	90	65	80	90	95	75	75	75	77
General aver. of candidates	62	62	78	78	81	80	70	80	71	72	

EXAMINATIONS AND TIME ALLOWED

Subject	Kind of Examination	
	Written	Other and Remarks
Anatomy	3 hours	Oral with prepared specimens; 20 minutes for each candidate
Chemistry and physics	3 hours	2 hours laboratory in physiologic chemistry*
Physiology	2 hours	Laboratory, 2 hours
Pathology	4 hours	Laboratory examination, 20 minutes, each candidate
Bacteriology	2 hours	Laboratory, 2 hours
Pharmacology, materia medica and therapeutics	2 hours	Laboratory, 2 hours
Medicine	3 hours	Clinical laboratory, ½ hour each candidate; chemical examination, 2 hrs.*
Surgery	3 hours	Lab., Op. Surg. and Appl. Anat., 2 hours;* clinical examination, 2 hours*
Obstetrics and gynecology	3 hours	Oral, 20 minutes each candidate
Hygiene	3 hours	
Medical jurisprudence	2 hours	
Eye, ear, nose and throat	.....	Clinical examination, 2 hours*
Dermatology	.....	Clinical, 20 minutes each candidate

* For each group of five candidates.

The examination consisted of written, oral, laboratory and clinical tests. The questions asked were as follows:

ANATOMY

(*a*) *Written Examination.*—Answer any three of the following questions: 1. Describe the shoulder joint with overlying structures and muscular attachments in immediate vicinity. 2. Describe minute anatomy of the kidney. 3. Attachments, action and nerve supply of following muscles: digastric, biceps femoris, internal oblique, soleus, pectoralis minor. 4. Name the layers of the blastodermic vesicle, and give the derivatives of each.

(*b*) *Oral Examination.*—Candidates examined individually for twenty minutes each during course of written examination. Questions asked: 1. Osteology: Scapula, axis, atlas and middle cervical, dorsal and lumbar vertebrae; temporal bone, femur, humerus. 2. Neurology: Brain models, casts, spinal cord. 3. Dissections: Showing knee and face and neck. 4. Microscopic slides for identification; bone, cartilage, blood, epithelium, and spinal cord.

CHEMISTRY AND PHYSICS

(*a*) *Written Examination in Chemistry.*—Answer any four of the following questions: 1. How would you proceed in the identification and estimation of arsenic in a toxicologic investigation? 2. What are the essential steps in the chemical examination of drinking water? 3. Write on the chemistry of nucleic acid and its purin derivatives. 4. Give methods of estimating the amount of sugar in urine. 5. Give method of determining the amount of CO_2 in alveolar air. 6. Give the chemical formulas for calomel and corrosive sublimate and detail the physical and chemical tests by which one of these substances may be distinguished from the other. 7. Give at least one method of estimating urea in urine. 8. Give the general properties (physical and chemical) of proteins. Give some of the most characteristic reactions used in their identification. Classify proteins. 9. What is an amino acid? What are some of the amino acids in the protein molecule? What is a peptid and polypeptid? 10. Define a carbohydrate; what are the chief carbohydrate constituents of foods; what are the final products of carbohydrate metabolism? 11. Define a neutral fat; what are the chief neutral fats in foods; what are the final products of the metabolism of fats? What is soap; how and when are soaps formed in the animal body? 12. To what acid is the acidity of normal gastric juice due? How would you determine the presence or absence in the stomach contents of this acid? 13. What are the chief constituents of milk, and how would you determine the amount of each? 14. How would you estimate the acidity or alkalinity of an aqueous solution? What is a normal or decinormal alkali or acid?

(*b*) *Laboratory Examination in Physiologic Chemistry.*—Candidates divided in two groups of five each. Each group allowed two hours. Questions asked: 1 and 2. Analyze urine for sugar. (*a*) Positive. (*b*) Negative specimen. 3. Do a complete analysis of urine including urea estimation. 4. Gastric contents, titration for acidity. 5. Quantitative sugar. Estimation in given specimen.

(*c*) *Written Examination in Physics.*—Answer any four of the following questions: 1. What is a lever? What is meant by its mechanical advantage? Name the various classes of levers and draw figures to represent them. Derive the equation which applies to them. 2. What is meant by density? By specific gravity? How are the densities of solids obtained, (*a*) if regular in shape, (*b*) if irregular in shape? How are the densities of liquids obtained? Derive formulas to be used in each case. 3. What is meant by a solution? Give several examples of quite different types of solutions. What is meant by an emulsion? Give example. What is meant by osmosis, osmotic pressure? State some of the laws governing variation of osmotic pressure in dilute solutions. Give illustrations of osmotic pressure as shown in in nature. 4. In what state or condition is a body while acting as a source of sound? Of a musical note? Define the terms pitch, intensity and quality as applied to the description of a sound. What is the mathematical connecting velocity, wave length, and vibrational frequency of a sound? 5. What is meant by resonance? Give a way of producing it by experimental means. Derive equation representing the necessary conditions for resonance in the method used. Give several instances of resonance occurring in nature. What is meant by vaporization? Why is it a cooling process? Why does water boil at a constant temperature usually? Why is the boiling point changed by a change in pressure? A dissolved gas? 7. State Ohm's law. Draw a simple electrical circuit, containing a single electromotive force, give numerical values to its various parts and compute the current flowing. What is the expression for the heat produced in the external circuit? 8. What are induced electromotive forces? What are some simple experimental ways of producing them? Where are they produced for practical purposes? How may they be made of large value? 9. What is meant by electrical capacity? Describe the construction of a condenser. What is its use in an induction coil? (Use figure in explanation.) 10. What is the electrolytic dissociation theory? Illustrate with (*a*) NaCl; (*b*) with H_2SO_4. How does it explain passage of electricity through liquid conductors? 11. What is meant by the refraction of light? Illustrate, using a convex lens. Draw figure showing structure of compound microscope, and explain the function of its various parts. 12. What is meant by a spectrum? What kinds are there and how are they produced? What practical uses are made of these various types of spectra?

PHYSIOLOGY

(*a*) *Written Examination* (two hours allowed).—1. Give the site of formation and the specific properties of the various internal secretions. 2. Draw a diagram representing simultaneous pressure changes within the aorta, the auricle, the left ventricle and right auricle. 3. Describe briefly the ferments and specific secretions of the pancreas and of the intestinal mucosa. 4. Discuss briefly the theories of renal secretion. 5. What stimuli and mechanisms are involved in the physiologic movements of the pupil of the eyes? 6. Sketch the factors involved in coagulation of the blood.

(*b*) *Laboratory Examination* (two hours allowed).—Each applicant required to solve at least one and at most three of the following problems: 1. Put up the apparatus and prepare the gastrocnemius muscle of a frog, with its attached nerve, and demonstrate on it the curve of single muscular contraction and the synthesis of tetanus. Show that nerve conduction is a vital phenomenon. 2. Demonstrate the "independent irritability" of muscle in a frog. Set up the apparatus and demonstrate Pflüger's law of contraction on the nerve-muscle preparation of a frog. Construct a table representing the facts. 3. Demonstrate reflex action on a cerebrum-free frog, and the influence of inhibitory mechanisms and processes. 4. Prepare apparatus, and the body of the rabbit provided, for the demonstration of arterial blood pressure and the effects on it of stimulation of the cardiac nerves. Isolate the pneumogastric, the sympathetic and the depressor nerve in the neck. Draw tracings illustrating arterial blood pressure in the rabbit and the influence on it of excitation of the cardiac nerves. 5. Prepare from the material provided a schema for the conversion of the intermittent flow into a continuous flow of fluids to apply to the explanation of the phenomena of the animal circulation. 6. (*a*) Set up an experiment for recording blood pressure in carotid artery of rabbit. Isolate vagus nerve and depressor nerve of heart. (*b*) Make synchronous tracings of venous and carotid pulse and analyze findings. 7. Record human arterial blood pressures by the auscultatory method; determine the length of each auscultatory "phase" and discuss its suspected relation to cardiac efficiency. 8. Draw tracings illustrating the following physiologic phenomena: 1. Arterial blood pressure in the dog; the effect on it of vagus inhibition; of stimulation of the accelerator nerves; of asphyxia. 2. Blood pressure in the rabbit; effects of vagus stimulation; effect of depressor stimulation; 3. Draw and analyze three sphygmomanographic tracings of the radial artery indicating the outflow period of the heart and variable states of peripheral resistance. 9. Demonstrate cardiac action in a pithed frog. Isolate the vagus nerve and demonstrate its inhibitory action. Show the relation of atropin to vagus inhibition. Perform and discuss the experiment of Stamius. 10. From the specimen of defibrinated blood provided, prepare a dilute solution of hemoglobin. Determine its absorption spectrum and depict on the blank scale provided, on which are marked the Frauenhofer lines B to F, first having located the spectrum of sodium vapor. Note the change in the spectrum from increasing the concentration of the hemoglobin solution. Prepare reduced hemoglobin with Stokes fluid and obtain its spectrum; reoxidize this and describe the color changes. Prepare carbon monoxid hemoglobin and determine its spectrum; try

to reduce it; try to convert it to oxyhemoglobin. Prepare crystals of hemin from a blood stain. 11. Demonstrate on the spirometer the various possible volume changes in the lungs. Determine as far as possible, and illustrate by a diagram the quantitative relations of the complemental, supplemental, tidal and residual air; the "dead space" and the "vital capacity." 12. Demonstrate the action of the intercostal muscles. 13. Prepare a 1 per cent. starch mucilage; a 5 per cent. aqueous dextrin and a 0.1 per cent. solution of dextrose and some of your own saliva. With the reagents provided test the solutions. Demonstrate the reaction of the saliva and the result of incubating it with the starch. From time to time test the resulting chemical changes. Place crystal of sugar on the back and on tip of tongue in succession and describe the sensory results; repeat with a crystal of quinin on the tip of the tongue. 14. Closing one eye and looking at an upright needle through a card pricked with two holes closer together than the diameter of the pupil; determine the *near* and *far* points of vision; note that the image of the needle becomes double when the eye is focused on points nearer or farther. Close one of the holes under each condition and note which image disappears. Draw and explain a diagram illustrating the course of light rays in the eye under the various circumstances. Obtain and describe a series of negative after-images by means of the various disks of cardboard provided. Draw the outline of the "blind spot" in the eye. 15. With a pair of compasses determine the relative fineness of localization on the tip of the tongue, tips of fingers, palm of hand, cheek, back of hand, forehead, back of neck. With a warm metallic knob determine sensitiveness to temperature in these areas. With a pointed metallic rod determine the distribution of temperature points on the flexor surface of your wrist. Compare your appreciation of small differences in weight through pressure sense alone and combined pressure and muscular sense. Show how to demonstrate Weber's law.

PATHOLOGY

(*a*) *Written Examination.*—Answer the first three questions and any two of the last four questions: 1. Discuss the criteria of malignancy. Name five tumors, giving sites, which are usually malignant. Name five, giving sites, which are not malignant. 2. A male, 60 years of age, has died of gastric cancer (a clinical diagnosis based on a two-year history). Describe the necropsy technic and the probable gross and microscopic findings. 3. Describe the process of healing in an incised, uninfected wound through the skin, fascia and muscles. What modification of the process would occur if the wound were infected at the time it was made with *Staphylococcus pyogenes-aureus* of moderate virulence? 4. Discuss the pathology of lobar pneumonia. 5. Differentiate, in parallel columns, the blood picture found in lymphatic leukemia and in pernicious anemia. 6. Describe the pathologic lesions in typhoid fever. 7. Discuss the pathology of nephritis.

(*b*) *Laboratory Examination.*—During course of written examination each candidate was given gross specimens and microscopic sections chosen from the following:

Gross Specimens: Cancer of lip; hyperplastic thyroid; cancer of breast, mastitis; miliary tuberculosis of lung; cavity formation in tuberculosis of lung; pneumonia, red hepatization; cirrhotic liver; chronic atrophic nephritis; nephroma ("hypernephroma").

Microscopic Specimens: Ulcer of lip; epithelioma of lip; mammary cancer, advanced; cancer, early; mammary adenoma; miliary tuberculosis of lung; pneumonia, lobar, hepatic cirrhosis; chronic diffuse nephritis; acute nephritis, early.

BACTERIOLOGY

(*a*) *Written Examination.*—Time allowed two hours. Questions asked: 1. Give morphologic and cultural characteristics distinguishing *Streptococcus pyogenes* from the pneumococcus. 2. What do you understand by a filterable virus disease? Give a list of such diseases affecting man. 3. (*a*) How do we differentiate the typhoid, enteritides (Gaertner) and colon groups by fermentation reactions? (*b*) How do we differentiate the paratyphoid organisms from one another? 4. (*a*) Name the anaerobes pathogenic for man. (*b*) Give the morphologic and cultural characteristics of *B. aerogenes capsulatus* (welchii) and briefly discuss its pathogenic importance. 5. (*a*) Define the following terms: Antigen. Passive immunity. Opsonin. Inactivation. Substratum. (*b*) Discuss briefly the principles of immunity involved in the carrying out of the complement fixation test.

(*b*) *Laboratory Examination* (time allowed, two hours).—1. Stain culture by Gram's method and report as to presence or absence of organism having morphologic and Gram staining characteristics of the meningococcus. 2. Examine throat culture for the diphtheria bacillus. 3. Make microscopic agglutination of unknown organism with typhoid serum. 4. Given an animal parasite for identification. 5. Given a stained blood smear for examination as to presence of the malarial parasite. 6. Given specimen of feces containing ova of intestinal parasites—identify one ovum.

PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS

(*a*) *Written Examination.*—Answer the first six questions; from Questions 7 to 12 answer four: 1. Give source and physic properties of atropin. What is its effect on the heart beat? In which disease of the eye has it an important diagnostic significance? In which disease of the eye is it contraindicated? 2. Describe the effect of chloral hydrate on the central nervous system. In what condition of disease is its use especially dangerous? Why? Write a prescription for the administration of chloral hydrate, with full directions for the patient. Indicate the condition for which this is prescribed and the dose intended. 3. Explain the constipation effect of opium. Describe the effect of morphin on the respiratory center. What are the signs of an overdose of morphin? 4. Describe the dominant action of strychnin on the central nervous system. Discuss the use of strychnin as a heart tonic. 5. Explain the therapeutic effect of quinin in the treatment of malaria, and outline the proper dosage. 6. Name three important members of the digitalis group. Describe briefly the action of digitalis on the heart and the circulation. Give a method of standardizing digitalis. 7. Outline the therapeutic use of digitalis in mitral insufficiency with broken compensation. Name three conditions of heart disease in which digitalis should be used with caution, and give reasons. 8. Discuss briefly the general action of diuretics. Explain the diuretic action of digitalis. 9. Outline the method of using sodium salicylate in acute rheumatic fever. Indicate the dosage. Write an appropriate prescription, with full directions for the patient. 10. Describe the condition known as delayed chloroform poisoning, indicating the principal organ affected, the pathologic change in the same, and the effects on the system. 11. Describe the action of the insoluble bismuth salts on the gastro-intestinal mucous membrane. Discuss the use of bismuth preparations in the local treatment of ulcers. Give the principal signs of bismuth poisoning. 12. What is the essential element in dried thyroid gland? Describe its action when given in therapeutic doses. Name three conditions in which it is used as a therapeutic agent. What are the signs of its excessive action?

(*b*) *Laboratory Examination.*—The first of the practical examination consisted of a demonstration on a dog that was prepared as follows: Anesthetized with ether, trachea exposed and severed, after which tracheal cannula was inserted and connected with ether bottle, artificial respiration being continued. Carotid artery was exposed and arterial cannula inserted, connected with manometer. Vagus nerve exposed but intact. Right femoral vein exposed and cannula inserted.

Various drugs were introduced into the animal, and the candidate was required to note his observation as to the effect on the blood pressure and the respiration, and to interpret the same. The following was the order. 1. Effect of ether. 2. Electric stimulation of vagus. 3. Effect of amyl nitrite inhaled into tracheal cannula. 4. Effect of epinephrin (intravenous). 5. Electric vagus stimulation (second time). 6. Effect of chloroform (tracheal cannula). 7. Effect of digitalis (intravenous) large tine tincture (alcohol free).

(*c*) *Individual Laboratory Tests in Pharmacology.*—In this test each candidate was required to carry out one of the following: Six frog experiments: Injection of unknown solutions: strychnin; caffein; chloral. Four cat's eye experiments: Introduction of unknown solutions: atropin; physostigmin. The candidate was required to carry out the experiment on the animal, record the results with his interpretation, and write as complete a protocol as possible.

MEDICINE

(*a*) *Written Examination.*—Answer ten of the following questions: 1. Give the physical signs and outline the treatment of mitral stenosis. 2. Discuss the etiology of acute pleurisy with effusion. Give the physical signs of a typical case. What are the indications for aspiration? 3. Outline the differential diagnosis between duodenal ulcer and gallstones. 4. Contrast the blood findings in pernicious anemia and chlorosis. Discuss the prognosis of each. 5. Describe a typical case of myxedema and outline the treatment. 6. What changes in the knee jerk are characteristic of: Tabes dorsalis? Motor hemiplegia (cerebral)? Diphtheric neuritis? Multiple sclerosis? Acute poliomyelitis (lumbar region)? 7. Name three forms of peripheral neuritis, and give characteristic diagnostic signs of each. 8. Discuss the relation of general paresis to syphilis. At what time in the course of syphilis of acute nephritis most likely to develop? Describe the urinary findings in a typical case. Treatment. Prognosis. 10. Give the diagnostic signs of infantile scorbutus. Outline treatment. 11. Give the diagnostic characteristics of the cerebrospinal fluid in: Tuberculous meningitis; epidemic cerebrospinal meningitis; acute anterior poliomyelitis. 12. Discuss briefly the principal theories that have been held as to the etiology of pellagra. Which do you consider the most reasonable, and why? 13. Discuss briefly the question of prophylaxis against malaria.

Clinical Laboratory (one hour).—1. Specimen of urine, chemical analysis and microscopic examination of sediment. 2. Recognition of hookworm ova, taenia scolices, *Trichina spiralis*, and different types of tuberculosis. 3. Clinical examination at Garfield Memorial Hospital covering a period of two hours. To each candidate were assigned three patients, referred to as one long and two short cases.

The candidate was given one hour and twenty minutes for the examination of the long case, and required to present a written clinical history, including physical examination. He was expected further to ask for the laboratory tests required by the nature of the diseased condition, and to stand an oral examination on the clinical history and diagnostic conclusions.

The two short cases were accorded twenty minutes each, and the examination was confined to the physical examination of a well-defined condition, as a typical heart lesion, aortic aneurysm, exophthalmic goiter or enlarged liver.

The patients assigned for examination represented the following diseases: Typhoid (1); tuberculosis of lung (3); acute endocarditis (1); aortitis with aortic insufficiency (2); aortic insufficiency (1); aortic aneurysm (2); chronic nephritis (1); bronchial asthma (2); chronic myocarditis (1); exophthalmic goiter (1); pernicious anemia (1); diabetes mellitus (2); hypertrophic cirrhosis of liver (1); tabes dorsalis (1); motor hemiplegia (1).

SURGERY

(*a*) *Written Examination.*—Answer five of the following questions: 1. Etiology and symptomatology of acute pancreatitis. Discuss briefly surgical treatment. 2. Discuss the differential diagnostic value of hematuria as a symptom. 3. Give treatment of compound, comminuted infected gunshot fracture of lower end of femur. 4. Discuss the routes and manner in which metastases may occur from carcinoma of the breast. 5. Discuss the pathology, symptoms and treatment of osteomyelitis of the tibia in the acute and chronic stage. 6. Discuss the signs, symptoms, differential diagnosis, and briefly the surgical treatment of extradural hemorrhage.

(*b*) *Laboratory Examination in Operative Surgery and Applied Anatomy.*—Candidates examined in two groups of five; two hours allowed each group.

First test (dogs were supplied which had been killed on preceding evening at the "pound"): Remove a portion of the small intestine about 10 inches in length, making two "blind ends" and a lateral anastomosis. For this one hour was allowed and the lines tested under water pressure. Candidates were then given living models on whom they were to point out; 1. The different incisions used in exposing the gallbladder, and discuss the advantages and disadvantages of each. 2. Determine by measurements point at which trephining would be done for hemorrhage from the anterior branch of the middle meningeal artery. 3. Outline the surface measurements for locating the fissure of Rolando. 4. Outline the incisions used for amputation at the shoulder joint and discuss methods of control of hemorrhage.

(*c*) *Clinical Examination.*—Candidates were examined in two groups of five each, two hours for each group. Each candidate was given one long case which he could examine for one-half hour, then being examined on it for ten minutes, and two short cases which candidates could examine for fifteen minutes each, then being examined for five minutes on each case.

Long cases: Tumor of liver (probably sarcoma); tumor of groin (carcinoma of inguinal glands); osteoma of femur; gastric ulcer; tumor of neck (carcinoma of the cervical glands following carcinoma of the tongue).

Short cases: Intracapsular fracture of hip; tuberculous epididymitis; hydrocele; united fracture of clavicle; myostitis ossificans of vastus internus; hernia (complete indirect inguinal); bone graft (Albee) for Pott's disease; cancer of mouth; varicose veins; subsiding appendicitis.

In addition to the surgical cases there were two patients with skin disease present. Each candidate was taken over then by the examiner on skin diseases. These patients were: 1. Negress, aged about 23, with seborrheic eczema; 2. Negress, aged about 29, purpura (or peliosis) rheumatica.

OBSTETRICS AND GYNECOLOGY

(*a*) *Written Examination in Obstetrics.*—Answer six of the following questions: 1. Give a brief description of the anatomy of the female pelvis, including the principal diameters. 2. Describe the normal mechanism of labor in a head presentation, the occiput to the rear. 3. What prophylactic measures should be observed in the conduct of the third stage of labor to prevent a postpartum hemorrhage? 4. Give a brief description of a Naegele oblique pelvis and the treatment of such a case at full term. 5. Give clinical history, diagnosis and management of a typical case of toxemia of pregnancy during the last few weeks. 6. Under what circumstances would you perform craniotomy? 7. Give a short review of the operation of ischiopubiotomy and its modern indications.

(*b*) *Written Examination in Gynecology.*—Answer all the following questions: 1. Describe three varieties of ovarian tumors, and give the differential diagnosis of each variety. 2. Indications and contraindications for ventral suspension or ventral fixation of the uterus. 3. Diagnosis, pathology and clinical history of carcinoma of the body of the uterus. 4. Management of a case of undeveloped uterus with so-called antedeflexion.

(*c*) *Oral Examination.*—During the course of the written examination each candidate was examined for twenty minutes orally. Questions asked: 1. Forceps: Classification of operations; indications and limitations of the high operation; indications for the low operation. 2. Mechanism of labor in a simple flattened pelvis: Engagement and movements of mechanism, including internal rotation. 3. Repair of lacerations after labor: Indications and advantages of the immediate operation; technic. 4. Cesarean section: Indications for the modern operation. Limits of contraction in the absolute indication. 5. Indications for the induction of premature labor: Indications, advantages over cesarean section in contracted pelvis. Relative indications in treatment of toxemia of pregnancy and of placenta praevia. 6. Salpingitis: Varieties, causes (including bacteriology), clinical history, diagnosis. 7. Cystocele: Definition, ordinary complications, symptoms and treatment. 8. Ectopic gestation: Definition, clinical history, diagnosis, treatment.

In addition to these, each candidate was asked one or two random questions, such as the use of anesthetics in obstetrics, the use of pituitary extract, displacements of the uterus, hemorrhage from the uterus, and disorders of menstruation.

HYGIENE

Written Examination.—Answer the following questions: 1. How would you determine the purity of a public water supply? 2. Discuss the hygiene of the mouth. 3. What measures would you adopt for the control of an epidemic of diphtheria among schoolchildren? 4. Name the diseases which may be conveyed by meat. 5. Name the insect-borne diseases and the insect host of each. 6. Describe a sanitary privy.

MEDICAL JURISPRUDENCE

Written Examination.— Answer the following questions: 1. How would you determine that a blood stain was made by human blood? 2. Describe some of the wounds falling within medicolegal consideration. 3. What means should be employed to establish personal identity (*a*) in a living person; (*b*) in a dead person. 4. What are the signs of death? How would you determine that a person is dead? 5. What is rape? Give the more prominent signs of rape, and indicate the steps essential to determine the fact that rape has been committed.

EYE, EAR, NOSE AND THROAT

Clinical Examination.—This consisted in demonstration of the candidate's ability to use special instruments required in eye, ear, nose and throat examining.

Oregon July Report

Dr. Herbert S. Nichols, secretary of the Oregon State Board of Medical Examiners, reports the practical and written examination held at Portland, July 5-7, 1916. The total number of subjects examined in was 15; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 34, of whom 24 passed and 10 failed. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
College of Medical Evangelists	(1916)	1
College of Physicians and Surgeons, San Francisco	(1916)	1
Chicago College of Medicine and Surgery	(1916)	1
Hahnemann Medical College and Hospital, Chicago	(1916)	1
Rush Medical College	(1908)	1
State University of Iowa, College of Medicine	(1897) (1908)	2
Baltimore Medical College	(1893)	1
Johns Hopkins University	(1916)	1
University of Michigan Medical School	(1906)	1
University of Minnesota	(1915)	1
Albany Medical College	(1914)	1
University of Oregon	(1909) (1916, 7)	8
Willamette University	(1905) (1907)	2
Jefferson Medical College	(1916)	1
University of Vienna	(1910)	1
FAILED		
College of Physicians and Surgeons, San Francisco	(1916)	1
Hahnemann Medical College of the Pacific	(1916)	1
Kentucky School of Medicine	(1906)	1
University of Louisville	(1907)	1
Johns Hopkins University	(1914)	1
University of Michigan Medical School	(1916)	1
St. Louis College of Physicians and Surgeons	(1915)	1
University of Oregon	(1916)	2
Tohoku Imperial University, Sendai	(1913)	1

Book Notices

MORTALITY STATISTICS, 1914. Fifteenth Annual Report. Cloth. Pp. 714. Washington: Government Printing Office, 1916.

In this report of mortality in the registration area, which now comprises 66.8 per cent. of the total population of the United States, a brief history is given of the development of the registration area to its present proportions. Interesting comment is made on the accuracy of statistics of causes of death as they are at present recorded. The difficulties of the collation and compilation of the numerous tables contained in the report are many. Statements of the specific causes of death, even under the International List, which is supposed to be followed at present, are defective. To attempt the tabulation of each cause of death reported on death certificates would mean their tabulation on an alphabetical basis, which would be impracticable. Several hundred thousand certificates are received each year on each of which the names of two or more diseases appear, while present classifications are based on the principle that each death must be ascribed to a single cause. The cooperation of local registration officials has been asked and received in hundreds of instances to correct such defective reports in order that proper classification of causes of death may be made. This has entailed a large amount of extra work on the part of the bureau and the registration officials, and of course could not be carried out for the entire number of certificates. So far as it has been done, the communication of registration officials with physicians, coroners, midwives and others has had an excellent educative effect which has been shown in subsequent returns. The bureau has also sent to physicians pamphlets on "Relation of Physicians to Mortality Statistics," and "Physicians' Pocket Reference to the International List of the Causes of Death" in the effort to improve the death data. As an indication of the possibilities of improving these data, the bureau sent letters and the last named pamphlet to physicians who had signed certificates with causes of death which would not admit of satisfactory classification, calling their attention to the defective terms used, and out of 2,000 replies received with additional information there was a net change in classification of 57.1 per cent. Of course the value of mortality or morbidity statistics in their applicability to the study of health problems depends on their accuracy, and the foregoing figures show the great need for improvement. It is the duty of physicians to acquaint themselves with the requirements of uniform and accurate reporting as provided in the International List.

EPIDEMICS RESULTING FROM WARS. By Dr. Friedrich Prinzing. Edited by Harald Westergaard, Professor of Political Science in the University of Copenhagen. Cloth. Price, $2.50. Pp. 340. Carnegie Foundation for International Peace, Division of Economics and History. New York: Oxford University Press, 1916.

This book is published under the auspices of the Carnegie Endowment for International Peace. It is a historical survey of epidemics resulting from war, and especially of the incidence of such epidemics in the civil population. After an introductory note and a general consideration of war pestilences, the systematic treatment commences with the Thirty Years' War (1625) and is carried up to the siege of Port Arthur (1904). Three great epidemics, the pestilence which accompanied the Thirty Years' War, the typhus fever in central Europe in 1812 and 1814, and the world-wide epidemic of smallpox which followed the Franco-Prussian War of 1870-1871 receive extended discussion. It does not appear whether or not Dr. Prinzing is a physician. It seems unlikely that he is, however, because of the remarkable statements that dysentery is not very dangerous as far as the patient's life is concerned, that bacillary dysentery is caused by the *Bacillus pyocyaneus* (p. 7), and that cholera is a disease characterized by frequent vomiting, without any mention of diarrhea (p. 6). The experience of the present war seems to show that the modern military sanitary service has this matter much better in hand than at such a comparatively recent date as the Spanish-American War of 1898, or the Russo-Japanese War of 1904. There is some hope, therefore, that the subject matter of this book has already become of purely historical interest.

Social Medicine, Medical Economics and Miscellany

THE DIFFICULTIES OF IMPARTING CLEARLY SURGICAL FACTS IN EXPERT TESTIMONY

LEVI J. HAMMOND, M.D.
Surgeon to Methodist Episcopal Hospital
PHILADELPHIA

Diversity of opinion arises, not from some persons having a larger share of good sense than others, but because they direct their thoughts along different ways, and hence do not fix their attention on the same object or purpose.

The difficulties, therefore, of our imparting knowledge, in a strictly forensic sense, arises from the fact that the nature, use and significance of terms employed by surgeons cannot with clearness and distinctness be understood by lawyers. To the surgical witness, there seems always a desire on the part of the counsel for matters of evidence rather than facts and conclusions. The surgeon cannot discover or expound new laws of physical nature at will, but should rest content with understanding existing laws, and should shape his testimony accordingly. He is in duty bound, therefore, to acquire sound knowledge and skill above the average in order to present intelligently the professional phase of the controversy, since the consequences involved are of the greatest moment, and for a proper consideration of which he is responsible to his conscience, to society and to justice. His testimony, therefore, must be grounded on plain and evident reasoning. There should be no attempt at reply to obscure, indistinct and vague questions, for, as yet, it is undetermined how far our understanding can extend its views, how far it has faculties to attain certainty, and in what instances it can only judge and guess.

We early learn that our understanding at best falls short of the possibilities which an individual occurrence may put within the reach of discovery; but in every instance there will be found enough to lead us to an intelligent performance of our duty, even though we may not grasp everything desired by the counsel. Nor will there be much reason to complain of the narrowness of our minds, if we employ them about the medical facts at issue, and not concern ourselves about the effect thus produced. We should not undervalue the advantage of our knowledge of the surgical phase of the subject, provided we have not neglected to improve our minds to the ends for which we are striving, namely, to inform and instruct the court and jury in surgical problems of which they at most hold only an abstract knowledge.

Under such circumstances there can be no just cause for complaint when probability is the most that can be asserted, especially when such knowledge is sufficient to govern intelligently the circumstances which at the time concern us. I take it that the intelligence of a court would not go to the length of disbelieving everything because the surgeon cannot with certainty know all things, or peremptorily or intemperately to require demonstration and demand certainty when there is only probability. It is impossible to make clear and distinct at all times a knowledge of surgical facts to those whose education and training have been constantly out of relation to the nature, use and significance of our descriptive language; for though it is proper always to express oneself in the most usual and familiar way by common words and expressions (by which means alone we can make known our views clearly to another), this is not readily done in surgery so as still to retain the full significance of these terms. For reasons of clearness, doubtful expressions which have scarcely any significance should never be employed; nor will they be if the surgeon examines critically what he knows before answering. The counsel attempts to secure positive assent to his forensic questions in the terms in which they are proposed by him and as only he clearly understands. It is evident, then, that the prime requisite, in addition to hearing the question, is that its meaning shall be rightly understood. Only obvious inquiries can be assented to on first hearing, for they promptly call into action knowledge gained by observation and experience. More general and abstract inquiries require a longer time for comprehension.

Because of this it is better that we grow fully acquainted with simple truths before they are proposed, for thus abstract inquiries in their turn will be found less difficult to grasp than at first believed. With statements expressed in unfamiliar words, the surgeon can neither agree nor disagree; he is obliged to confess ignorance, as such words are but empty sounds. The answer to a question may be entirely correct, yet not equally evident. Some questions are so obvious that they carry their own meaning with them, requiring neither profound reasoning nor undue exercise of the mind to discover clear and distinct answers; while others are so speculative in character as not possibly to be assented to on first hearing.

Again, the words in themselves may be easily understood, yet the significance of their precise meaning, when expressed in forensic terms, may not be grasped, especially when they have never even been thought of or heard of before; for education and learning along different lines cannot instantly and at will cast thought into molds. Some lawyers, however, at times imagine that our minds lie open to every one of their views, as though the latter were native and original impressions, though in many instances they may be entirely new to us. This attitude assumes that a surgeon is prepared at all times to reply categorically to a question, leaving no doubt of the innate existence of special legal ideas. Such would surely be evidence of universal knowledge.

If I am correctly informed, knowledge comes to us in various ways: that of our being, by intuition, reasoning, and by sensation. The latter is the source through which the greater extent of knowledge is acquired; hence the necessity of actually receiving information from another. It may be that some of the legal inquiries to which we at times object are capable of demonstration, and it is our fault that we do not readily grasp them, provided they concern subjects on which there is agreement, and they are presented in unequivocal terms. It is possible that even practical truths, when stated by the surgeon and not fully comprehended by the counsel, may be so restated by him as not to be received without doubt or question by a jury. Under such circumstances, the witness may be so put off as to be unable longer to keep faith or even observe the rules of justice toward the counsel. Under such circumstances, his further replies to inquires may not interpret either his practice or his thought. One, I take it, should be regarded as void of good sense who failed to demand proof of the truth of an inquiry, for when such information is at hand, it carries its own light and evidence with it. One who understands the terms, if properly qualified, is ready promptly to agree or disagree according to his convictions. If a question is proposed to one who never before heard it but has capacity to learn its meaning, might he not, without being in contempt or even appearing presumptuous, ask a reason, and should not the counsel who proposed it be bound to make its significance clear to him?

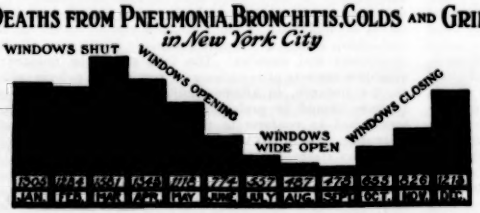
It is the conviction of many that if a common understanding could be caused to exist between the legal and medical professions as to the particular information necessary intelligently to instruct a court or jury, much of the vague, obscure and, at times, unintelligent medical testimony would not longer be exhibited, but in its stead would be developed a greater promptitude of thought, a greater clearness and distinctness of imagination, and a greater fulness and readiness of memory.

1222 Spruce Street.

Open Window Campaign in New York

The New York City Department of Health has inaugurated a general campaign for better ventilation. The week of December 4-10 was designated as "Open Window Week," taking the place of what was formerly Tuberculosis Week. Each day of the week is marked by a special feature. Monday is Open Window Day; Tuesday, Medical Examination Day; Wednesday, Walk to Work Day; Thursday, Sanitary Workshop Day; Friday, Children's Health Day; Saturday and Sunday, Sunshine Days. A diagram showing deaths from

pneumonia, bronchitis, colds and grip in New York City for each of the months of the year and the close relation between closed windows and increased death rate is being displayed in 3,000 surface, elevated and subway cars. The change


DEATHS FROM PNEUMONIA, BRONCHITIS, COLDS AND GRIP
in New York City
WINDOWS SHUT
WINDOWS OPENING
WINDOWS WIDE OPEN
WINDOWS CLOSING
"OPEN WINDOW WEEK"
DEPARTMENT OF HEALTH OF THE CITY OF NEW YORK

Relation between closed windows and increased death rate.

from Tuberculosis Week to Open Window Week is significant as showing the greater emphasis which is being laid on health and the decreasing emphasis on disease.

Medicolegal

As to Enjoining Publication of Charge of Malpractice

(Wolf vs. Harris (Mo.), 184 S. W. R. 1139)

The Supreme Court of Missouri, Division No. 2, reverses a judgment obtained by the plaintiff, a physician, who brought this action in equity to restrain perpetually and enjoin the defendant from publishing certain alleged false, defamatory and libelous statements concerning him. The court says that the plaintiff averred that he was a practicing physician and surgeon, had been such for nearly a quarter of a century, reciting the extent of his studies, practice, and experience, that he was called to treat a young daughter of the defendant, and, though exercising in that behalf the utmost care and skill, the patient, without fault of the plaintiff, died, that thereafter the defendant demanded of the plaintiff in divers ways and at divers times and places the sum of $10,000 because of the death of said patient, and threatened that, unless said sum was paid, the defendant, by circulating charges of criminal negligence of the plaintiff in connection with the death of said patient, would destroy the reputation, business, and professional standing and income of the plaintiff, which the plaintiff averred to be lucrative and large, and that in pursuance of said threats the defendant published and circulated more than 1,000 copies of a false and libelous writing concerning the plaintiff, which was set out in the petition, and which was, if untrue, manifestly libelous. It was further alleged that thereafter the defendant, with the same malicious intent and design, published and circulated among the plaintiff's patients, friends and acquaintances more than 5,000 copies of a pamphlet in which were repeated the same or similar false, defamatory and libelous statements, and that subsequently the defendant procured the printing of a large placard, likewise containing false and libelous statements concerning the plaintiff, and that all this was done for the purpose of wrongfully extorting from the plaintiff the said sum of $10,000. It was further alleged that the defendant threatened to continue, and until and unless restrained and enjoined would continue, to print, publish and circulate the same or similar libelous statements touching the plaintiff, etc. But the court is constrained to hold that the petition stated no cause of action, because injunction (when, as here, that is the sole relief prayed for) will not lie to restrain the threatened publication of either a libel or a slander. Any other view overlooks the spirit, if not the letter, of the state constitution, which substantially guarantees to the citizen the privilege of saying, writing and publishing whatever he desires on any matter, subject only to liability (either civil or criminal, or both) for any abuse of that privilege. It follows that, if the statements made were true, the defendant was permitted to publish them when and where and as often as he would, and that he was entitled to a jury of his countrymen to determine whether the statements were true or false. That the statements on which this action was bottomed seemed on their face to be malicious and obviously untrue did not change the case. However, after an action at law in which there was a verdict finding the statements published to be false, the plaintiff, on an otherwise proper showing, could have injunction restraining any further publication of that which the jury found to be actionable libel or slander, and of slanders or libel of a like or similar import. If the plaintiff had gone to a jury with this alleged libel and obtained a judgment, which, owing to the insolvency of the defendant, he was unable to collect, further publication of a libel of like or similar import ought to be enjoined. Or, even if the plaintiff had joined a count at law for damages for libel with a count for injunction on the theory of a threatened continuance of the false publication, and had alleged and proved, either the inadequacy of remedy by reason of the libeler's insolvency, or the legal necessity of the remedy sought in order to avoid a multiplicity of suits, the court, on a finding by the jury of the libel, and by the court of the said necessary facts on the equity side, could have enjoined continued publication thereof.

Society Proceedings

COMING MEETINGS

American Academy of Ophthal. and Oto-Laryn., Memphis, Dec. 11-13.
American Association of Anatomists, New York, Dec. 27-29.
American Physiological Society, New York, Dec. 28-30.
Medical Association of the Isthmian Canal Zone, Ancon, Dec. 16.
Society of American Bacteriologists, New Haven, Conn., Dec. 26.
South. Surg. and Gynec. Assn., White Sulphur Spgs., W. Va., Dec. 11-13.
Western Surgical Association, St. Paul, Dec. 15-16.

NEW ENGLAND PEDIATRIC SOCIETY, NEW JERSEY STATE PEDIATRIC SOCIETY, NEW YORK STATE SOCIETY, PHILADELPHIA PEDIATRIC SOCIETY, AND PEDIATRIC SECTION OF NEW YORK ACADEMY OF MEDICINE

Joint Meeting, held in Boston, Nov. 4, 1916

DR. ALEXANDER EASTMAN, President of the New England Pediatric Society, in the Chair

Medico-Educational Problems in the Treatment of Atypical Children

DR. G. HUDSON MAKUEN, Philadelphia: The factors that determine the psychophysical condition as well as the personality of children are heredity and environment. Environment is subject to change. The most important feature in the child's environment is his education and training, and the most important and neglected period in the life of any individual is that which comes prior to the so-called school age. Teachers assert that the failures of pupils are due chiefly to faulty habits formed before their entrance into the schools and colleges. The so-called fixed habits are the early ones, formed during the child's physical and mental development in the first years of his existence. The general physical condition of the child may be influenced for good or ill by the character of its mental and emotional activities. Medico-educational methods become real measures of prevention only when they begin to be employed during infancy. Nervousness is the most characteristic malady of children, and its treat-

ment should be, first, preventive and, second, remedial or curative. Preventive treatment is applicable in the earliest infancy, and it consists largely in an attempt to control the child's physical activities through a careful direction of his psychic and emotional activities. If the child is normal physically, this treatment should result in the development of normal physical and emotional faculties; but if the child inherits physical abnormalities, such as cleft palate or other irregularities of structure, surgery and some form of medication may be indicated in addition to the psychophysical training. Punishment should never be necessary, except, perhaps, at the very beginning and before the child is mentally susceptible to medico-educational measures. The remedial and curative treatment of atypical children is an effort to improve their condition through their physical activities. The personality of the child is modified and molded by what some one has called the reflex influences of its own acts and expressions. The Japanese have a theory that for one to be what he would like to be it is only necessary for him persistently to act the part. Doing things with purposeful intent is found to have a greater educational value than doing them carelessly or even in play. The play instinct is an important factor in child development, but at present it is overworked. The "work instinct" is equally important and is now being greatly neglected in the early training of children. The child should be taught to do things not because they are easy but because they are right, and the greater the difficulty in doing them the greater the educational value. Moreover, work and play should not be commingled, but they should form two distinct factors in education. Correct postural attitudes and good respiratory, phonatory and articulatory habits should have a conspicuous place in all medico-educational methods, because of their esthetic value and because they tend to give to the individual greater self-respect, self-reliance and self-control.

Intestinal Venous Stasis: Diffusion of Bacteria and Other Colloids

DR. FENTON B. TURCK, New York: Emulsions of bacteria injected into the intestine of animals rapidly diffuse through the membranes and tissues. The diffusion route taken by the bacteria from the intestine is the interstitial route taken in the adult. The micro-organisms diffuse rapidly through the mucous wall of the intestine, between the glands into the areolar tissue, and then course along the wall of the intestine between the muscle coat and the mucous membrane. In the new-born there is no arrest of passage by the mucosa labyrinth: a wall impervious to bacteria has not yet been formed. As the body grows, the tissues become less porous to bacteria. When disturbance of the splanchnic circulation and muscular atony of the wall of the alimentary tract is produced, a reversion to the fetal state of the intestine occurs, and the body needs protection from the toxins formed in the zona transformans, and "antianaphylaxis" is automatically established. The bacterial porosity of the tissue is materially increased by mechanical obstruction, interruption of the circulation sufficient to cause atrrophy, and interference with the nerve supply. Permeability is not a matter of "thickness." In order to increase permeability, fundamental changes in the flora of the individual and in the physiology of the organ must be induced. Among the means of bringing about the latter are thirst, hunger, overfeeding and shock. Fat and especially fatty acid increase the diffusion rate of the intestinal bacteria through the intestinal wall and hasten the fatal termination. Lesions due to the permeability of the tissues to bacteria in the upper intestinal tract are more quickly fatal than those in the lower intestinal segments. The passage of the living bacteria into the tissues causes reduction by adsorption of the protective bodies (antiferments), and results in autolysis. The reaction is anaphylaxis. When the condition is acute, the symptoms are shock, distention, prostration, convulsions, etc.; when chronic, the symptoms are wasting, anemia and marasmus. The objects in treatment are the reduction of fatigue of hollow muscle, prevention of fatty acid intoxication and intestinal retention, absorption of intestinal flora, correction of acidosis, reduction of splanchnic venous stasis, increase of immunity, and maintenance of nourishment. In severe acute cases the treatment is gastric lavage, colonic lavage, lavage with weak silver nitrate, followed by sodium bicarbonate, demulcents, venesection, and infusion of sodium bicarbonate solution. In severe cases the continuous bath and transfusion of autoserum is indicated; in moderate and chronic cases, gastric and colonic lavage with gentle pneumatic gymnastics, alkaline demulcents and vaccines. The food should be reduced to minimum fineness of particles as it reaches the pyloric orifice, as, for instance, in albumin milk. The intervals between feedings should be prolonged, and regular feeding periods established to conform to the curve of muscle work and relaxation. Food rich in mineral salts should be provided, as vegetables steamed (not boiled) and made into purées. The intake of fat should be reduced to the minimum requirement. No extractives should be allowed, and for a time the total intake of protein should be reduced. To prevent the passage of bacteria Irish moss or liquid petrolatum should be used. To cause adsorption of bacteria, colloids, fullers' earth, charcoal, or fine bran should be used. If required, laxatives—phenolphthalein and calomel—should be given, and belladonna in case of spasm.

Epidemiology of Bacillary Dysentery

DR. W. G. SMILLIE, Boston: The floating hospital furnished conditions favorable to a study of bacillary dysentery, because of the fact that the infants were usually under 15 months of age, whose activities were limited and who came into contact with only a few people and ate at most only a few articles of food. In all, seventy-nine cases were studied, forty-nine of them being house cases, and twenty-six related cases discovered in the course of the investigation. There seems in this series of cases to be no relation between high temperature, high relative humidity and the case incidence. The case incidence seems to be more closely related to flies, rather then temperature, for the hot weather was over before there were many cases of the disease, and reports of cases seemed to come in well through September, though the humid weather had gone. The families chiefly affected were not the illiterate foreigners, but the careless neglectful poorer class American family, more particularly the first generation family. This, we believe, is due to the fact that foreigners nurse their infants. Forty-one homes were scored by a method similar to that used in scoring dairies; the highest score was 94 per cent., the lowest 15 per cent. The average score for those cases of bacillary dysentery which were due to direct contact was only 48 per cent. The average score of those cases which were a source of infection to others was 41 per cent. The average score of those cases due to infection from food was 59 per cent., and the average of those cases for which no source of infection was found was 71 per cent. The sources of infection may be summarized thus: contact with an acute case, 21 cases; contact with a carrier, 2 cases; contact with a house case, 4 cases; condensed milk epidemic, 15 cases; ice cream cones, 9 cases; unknown, 15 cases. An important fact with reference to the contact cases is that many of these cases were in the older members of the family, and in these persons the disease was mild. Undoubtedly many cases of summer "ptomain poisoning" are cases of bacillary dysentery. A mild adult case may readily infect a baby, sometimes with rapidly fatal results. As a general rule it may be stated that in every dirty or careless house in which the sick child remained for more than one week there resulted a contact case. Only four babies developed bacillary dysentery in the wards of the hospital, although patients with virulent bacillary dysentery were on board all summer. No hospital should admit bacillary dysentery unless it has the facilities for isolating these patients, for the most rigid precautions are necessary, particularly fly exclusion.

DISCUSSION

DR. HENRY I. BOWDITCH, Boston: In 1914, seventy-nine cases came under our observation, of which 68 per cent. gave a positive Flexner organism; in 1915, there were seventy-five cases, and 85 per cent. showed the Flexner infection; in 1916, there were sixty-four cases, and 88 per cent. showed the

Flexner infection. In fifty-one, or three fourths of these cases, the bacteria were recovered from the stools and in the others at necropsy; in a few the diagnosis was made by finding the agglutinins. At the same time we constantly tried to see how much of a factor the gas bacillus, or the *Bacillus aerogenes-capsulatus*, was in these dysenteries. It was found not to play an important part; it disappeared quickly in the early course of the illness and frequently was seen to reappear later, when other foods were given. In 1914, a closer investigation than usual of the bacillus was made. Here it was found in 11 per cent. of infectious conditions, in 27 per cent. of digestive disturbances, in 28 per cent. of malnutrition cases, and in 28 per cent. of normal cases. The infectious cases were studied closely, while the other cases were picked at random. Our feeling at present is that the Flexner organism is the main etiologic factor, and that the gas bacillus is a complicating, but probably not the main etiologic factor. This is different from the stand taken some years ago. The mode of treatment carried out on the floating hospital this summer was to keep the child on water for the first twelve hours and then on a food with a high percentage of carbohydrates and moderate protein, as fat 0, sugar 6 and protein 1.2, in the form of a fat-free milk with sugar added. This was continued if the gas bacilli were not present, but when the gas bacilli did occur, the carbohydrates were diminished.

AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY

Seventh Annual Meeting, Held in Milwaukee, Oct. 19-21 1916

The President, DR. S. MCC. HAMILL, Philadelphia, in the Chair

Rural Obstetrics

DR. GRACE L. MEIGS, Washington, D. C.: At least 15,000 women die each year in this country from causes connected with childbirth, and about 7,000 of these die from childbed fever. This fact will be brought out in a bulletin soon to be published by the United States Children's Bureau. Deaths from these causes have long been known to be largely preventable; it is not realized that they are not being prevented.

DISCUSSION

DR. WILLIAM C. WOODWARD, Washington, D. C.: Stillbirths have not been recorded for a considerable number of years as part of infant mortality because infant mortality unfortunately has been, until recently, computed on population, and not on registered births. In the annual reports of the District of Columbia we give a statement of all stillbirths, the period of gestation at which stillbirth occurs, the causes and race. More recently we have taken up a more intensive study of stillbirths, in the practice of midwives, physicians, in and outside of institutions. One difficulty with respect to stillbirth statistics and one that relates with particular force to the occurrence of stillbirths in rural communities is the ease with which the body of the stillborn child is disposed of. Under our law any birth must be reported if the child has apparently passed the fifth month of gestation. When the birth is reported, the body must be disposed of as the body of any dead person. In the average rural community the stillborn child is buried on the premises and nothing is said about it. The relatively high percentage of stillbirths in institutions is due to the fact that many women are brought to the institution in confinement; in many cases a midwife has bungled the case, and the patient is brought to the institution in bad condition. I am not satisfied with that. We must have the figures to prove it. Among the colored people the stillbirth rate is much higher than among the whites. Whether or not that is due to syphilis we do not know. I am inclined to think that it is not altogether the result of syphilis.

DR. FLORENCE SHERBON, Washington, D. C.: A summer's experience as an investigator in rural communities has given me a few convictions. I went out to do this rural investigating with two ideas in my mind: first, that maternity is pathologic, and second, that the mother's greatest menace is the midwife. I have come back from this investigation with the profound conviction that maternity need not necessarily be pathologic; that it was intended to be a normal function; that it is rapidly becoming pathologic for a variety and complication of conditions, social and otherwise, and that this fact should be the starting point of our investigations and observations. I am convinced that so far as the rural mother, at least, is concerned, the country doctor is a far greater menace that the midwife. The practice of rural obstetrics is difficult. These men are sent out from our medical colleges and schools with nothing but a smattering of knowledge of the mechanics of childbirth. These women, who are ignorant and unprepared, but who have had twelve or fifteen children, know something which not one of these country doctors, or any other obstetric specialist of the other sex, can ever find out. They know enough to let well enough alone, and they have patience to wait. A good deal is being asked of the country doctor who is called on to go out 6 or 8 or even 12 miles from the telephone if he is expected to sit down and wait patiently. We found more complications and bad results from that one situation than from any other single factor.

DR. LYDIA DE VILBISS, Topeka, Kan.: The department of health of Kansas has established a mother's confidential registry. The expectant mother registers with us, and we send her a series of nine prenatal letters covering about the material that is given in the children's bureau bulletin on prenatal care. Then she registers the baby, and we send her five more letters. Of course, we often recommend that the mother see a doctor, or have analyses made, but it often happens that the doctor is hopelessly out of her reach. I asked the governor to put up a handsome silver loving cup to be awarded to the healthiest county in Kansas next year, and county health officers, county medical officers, medical societies and school officers are working hard to get that trophy.

DR. H. M. BRACKEN, St. Paul: The midwife is a necessary evil in some places, but I hope she will not become permanent in rural work. I would much rather depend on a farmer's wife in the case in which it is necessary to rely on such nonmedical assistance. The encouragement of midwifery practice is not an encouragement of better obstetric practice. There are just two possibilities for helping out in rural districts. One is the small hospital. The point has been raised that the doctor is in a hurry. He is, and he is negligent. It has been said that the doctor often makes only one visit, and fails to inform himself as he should. It is true. When I go about the country, and doctors show me their little hospitals, the first question I ask is, "Do you take obstetric cases here" More and more I get the answer, "Yes" to that question. The doctor does it partly, you may say largely, if you choose, from a selfish point of view. He would rather have the patients come to him than go to the patients. He does not have to spend a lot of time getting to them; it is much better for him. But does the patient benefit by this selfishness? Certainly. If a mother has once gone to one of these hospitals she will go again next time. The country nurse is a great feature, but we cannot depend on the country nurse entirely in obstetric work. Another point is that people have not yet begun to appreciate that the human being is worth something. The farmer looks after his cattle, and is not going to take any chances with them. He can see the dollar there, but he cannot apparently see it in the baby. It is time he was being made to see it.

DR. DOROTHY REED MENDENHALL, Madison, Wis.: I made a little investigation of the conditions in Wisconsin in 1915, and was surprised to find that the number of babies delivered by midwives was relatively low, about one sixth of the whole number. Furthermore, puerperal deaths seemed in inverse relation to midwives. The midwife was a much smaller factor in the situation than the physician.

MISS KATHERINE M. OLMSTED, Milwaukee, Wis.: It has not been my experience that we needed to convince the mothers in the country that they should call the doctor instead of the neighbor. They are anxious to learn. We need to give them some one from whom they can get this knowledge.

I thought when I went out to do rural nursing that it would be a difficult proposition to teach them this. I found it was a difficult thing to teach the farmer that he should sleep with his window open, but the easiest thing in the world to teach the mothers what they should know before delivery. I believe the best progress will be made through the schools. If the nurse can go into the schools, her presence in the community becomes known all over the county, and quickly she is requested by numerous notes and messages to come and visit various mothers; she is asked to have classes; she has unlimited opportunities. But she must have supervision by the doctors. I do not feel that a full time health officer can do a great deal for obstetric patients unless he is willing to go out and take them.

MRS. G. A. HIPKE, Milwaukee, Wis.: Is not the question of better obstetrics synonymous with better economic conditions? Will this not be solved more through health insurance and maternal pensions than in any other way?

DR. WALTER G. DARLING, Milwaukee, Wis.: The problem of rural obstetrics is a question of community interest and community responsibility. There should be a county institution; whether it should be a general hospital or a special obstetric hospital must be worked out; a county general hospital I think could be made to serve the purpose almost as well as one devoted exclusively to obstetrics. There is great need for trained nurses. We know too well how the efforts of the country practitioner are entirely for nought when his work is upset immediately after he has left the house. A competent nurse must be there to follow his good work. Community hospitals, similar to the tuberculosis hospitals that are now generally accepted, could not only care for obstetric patients requiring hospital care but could train nurses for rural work. The community hospital plan would have to be supported by some sort of state insurance so that the women of rural communities could afford to have the nurses and could get the proper attention.

Morbidity and Mortality of Measles and Pertussis with Particular Reference to Age

DR. BORDEN S. VEEDER, St. Louis: The annual average death rate for the registration area for the ten-year period 1904-1913 was 10.5 per hundred thousand population for pertussis, and 10.2 for measles. Between 9,000 and 10,000 deaths occur annually in the United States from each of these diseases. About 80 per cent. of the pertussis deaths are in infants under 2 years, and 99 per cent. in children under 10. Over half of the measles deaths are in infants, and about 90 per cent. in children under 10. The two diseases together are responsible for about one twentieth of the total infant deaths. Both diseases are a much greater factor in the production of infant mortality than either scarlet fever or diphtheria. Pertussis has its highest incidence in the first year, and decreases rapidly after the third year of life. Measles reaches its height in the second year of life, and maintains a fairly level curve until the sixth year. The case fatality rate is high in infancy, and then falls with great rapidity in both diseases.

Measles from the Standpoint of Prevention

DR. J. G. WILSON, Ellis Island, N. Y.: Existing social and housing conditions practically prevent the entire stamping out of a disease which is theoretically entirely preventable. Daily inspection and prompt isolation of every child with any degree of fever is entirely successful in preventing epidemics of measles in modern up-to-date institutions. At the immigrant station at Ellis Island, this method has sufficed to prevent any epidemic outbreak. This procedure may in a modified manner be applied to the ordinary civil community without working undue hardship. To protect the community in the same sense that it can now be protected against smallpox, typhoid and diphtheria, some safe method of vaccination or antitoxin protection must be evolved.

Pertussis from the Standpoint of Prevention

DR. ISSAC A. ABT, Chicago: The mortality from whooping cough is considerable. During 1911, 6,251 patients died of the disease in the United States. Since the disease is carried by persons who are ill with the disease or who are carriers for the micro-organisms which cause the disease, quarantine and isolation are desirable. Health boards, parents, teachers and all who are concerned in the prevention of disease and saving life should cooperate in enforcing such regulations as will prevent the sick from attending school, visiting the playgrounds and public conveyances, and in isolating the sick and those who are suspected during the catarrhal stage.

DISCUSSION

DR. FRANK C. NEFF, Kansas City, Mo.: The great drawback and failure of notification and placarding has been that it has been nobody's business to notify except the physician's. Probably three fourths of these patients never see a physician. Inspectors from boards of health, at least during the period of an epidemic, should visit the various districts of a city and ascertain if these contagions exist there. Extension of the very efficient district nursing work to this particular line of epidemic would help greatly in disclosing the presence of infectious diseases that are ordinarily concealed from the public.

DR. H. L. K. SHAW, Albany, N. Y.: One of the sanitary supervisors in the New York State Department of Health worked out a plan which was followed last year during an outbreak of the measles. According to this plan, the health officer notifies the teacher in the school when a case of measles occurs among the pupils. Another ingenious method was the employment of a junior health officer. The teacher appoints a boy or girl each week to hold this office. These junior officers have a report blank, and, armed with this, go to the homes of any children who have been absent to find out if there is any disease. At the end of the quarantine, a special note has to be returned signed by the health officer, because the family physician will often sign without recording the date. The state of New York two years ago formulated a new sanitary code, and relegated the door placard to the past. The health officer is now required only to placard the room. We allow the parents, the wage earners, to go out and in freely, as long as the health officer is assured that they do not enter the room.

Propaganda Work from the Point of View of Public Authority

DR. H. L. K. SHAW, Albany, N. Y.: With a carefully prepared plan of public health education, it is possible to accomplish much, particularly along the lines of infant welfare. Our first step in undertaking an infant welfare campaign is to make a survey of the community affected. It is immensely valuable to the public health nurse who is sent into the community. The local authorities are only too glad to have this cooperation of the state department. In many instances, local conditions are such that a natural spirit of cooperation between all of those interested in the subject of infant welfare is a possibility. The state department, therefore, becomes a sort of intermediary, and through its efforts molds all individuals and organizations into a compact body having a definite program of accomplishment.

DISCUSSION

DR. HENRY F. HELMHOLZ, Chicago: The problem of propaganda from the standpoint of the private organization is essentially different from that of the state or city institution. The private organization usually represents pioneer work. We have two lines along which the private organization must work. First, to enlighten the public on the question of the necessity of infant welfare work, interesting it to support the work which the organization is doing, and, second, to make the public realize that infant welfare work can only be carried on adequately if supported by the municipality. The second line of propaganda is the one almost universally neglected, and it is the most important.

Work of the University Extension Department in Educating the Mother Along the Lines of Prenatal Care

DR. DOROTHY REED MENDENHALL, Madison, Wis.: In Wisconsin, during the past four years, the teaching along pre-

natal and natal lines has developed in two ways. A correspondence course on the care of the expectant mother has been offered. This course aims to give the mother the necessary knowledge, presented in a simple, usable way, to enable her to keep herself in good physical condition. Also, during the last three years, at the community institutes held in different villages and small towns in the state under the auspices of the agricultural and university extensions, talks have been given on the care of the mother before and after confinement, and the hygiene of the young child. An informal consultation hour is held after the lecture, for those who do not care to present their problems in the open discussion. These talks are given usually to women; but not infrequently at evening meetings, with a mixed audience, the question of the care of the child-bearing woman as a community problem, and its relation to the health of the community are discussed and arouse considerable interest.

(To be continued)

MEDICAL SOCIETY OF VIRGINIA

Annual Meeting, held at Norfolk, Oct. 24-27, 1916

Surgical Care of Wounds in the European War

DR. R. C. BRYAN, Richmond: I saw few wounds of the face. The number of wounds that were caused by indirect violence, pieces of stone, wood, barbed wire, and hobnails from shoes, driven by explosion of shells, was remarkable. Eight thousand hospitals are scattered through France. I saw only two patients die from tetanus. The Roentgen ray is used constantly to locate foreign bodies. Rifle balls are left in situ. I saw one buried in the greater curvature of the stomach, another just posterior to the neck of the femur, and another at the base of the heart. They were all left alone. All wounds are considered infected until proved otherwise. I was much struck by the mathematical and careful sterilization. No fragment of bone is removed that has periosteal attachment. Turkish toweling is used as dressing, and Carrel tubes are used freely. Among 1,700 men passing under my direct observation I saw not a single case of venereal disease.

What We Know Today About the Tonsils

DR. D. A. KUYK, Richmond: There are numerous theories, the protection theory, the hematopoietic theory, eliminating theory, immunity theory, and the physicomechanical theory. The last is not a theory but a fact. The tonsil acts as a fulcrum for the pharyngeal muscles, and as a prop to the soft palate, especially in singers. Its threefold function should be considered carefully before removal.

Cancer of Thyroid

DR. L. B. WILSON, Rochester, Minn.: One and five-tenths per cent. of simple goiters have been found to be cancerous. Thyroid disease occurs at the cancer age, 70 per cent. of the patients are beyond 40 years of age, and 20 are under 20 years of age. Sarcoma is not preponderating in the young, but occurs in the elderly. One third of all cases are sarcoma, one half carcinoma, and one sixth mixed. About 53 per cent. give a history of enlarged goiter before constricting symptoms appear. The initial symptom is not pain but pressure due to the formation of fibrous tissue, interference with local nerves, and then metastasis. More mistakes are made in diagnosis when adenocarcinoma exists. Treatment is by surgery or radiotherapy. Hope is not great; only twenty-five of our eighty-two patients are alive three years after operation.

DISCUSSION

DR. SHELTON HORSLEY, Richmond: Have studies shown the route of metastasis, whether by the lymph channels or the blood vessels? Is there any difference in the metastasis of sarcoma and carcinoma?

DR. L. B. WILSON, Rochester, Minn.: Metastasis varies as to the type of tumor. In sarcoma it is through the blood vessels and generally to the lungs, while in adenocarcinoma it takes place through the lymph channels to the mediastinal glands. The adenocarcinoma and the mixed type do not metastasize as readily.

DR. A. L. TYNE, Staunton: Dr. White of the Massachusetts General Hospital said that he saw more thyroids in the valley of Virginia in two weeks than he saw in a whole year at home.

DR. CHARLES ROBINS, Richmond: I have observed that a large number of these patients have errors of menstruation, either amenorrhea or menorrhagia. Is there any connection between the sex organs and the thyroid?

DR. L. B. WILSON, Rochester, Minn.: I do not believe that there is any connection. Kendall seems to have found the key to protein metabolism. He gave dogs amino acids and then alpha iodin. Chemically he burned up the dog; the temperature would go up to 108 or 110 F.

Cranial Decompression for Certain Intercranial Conditions

DR. WILLIAM SHARPE, New York: If the patient cannot be benefited, it is not right to make him worse. If this branch of surgery were limited to the removal of brain tumors, it would be discouraging. The earlier the diagnosis the better the prognosis. Tumors of the midbrain are hard to reach, and it is rare that they can be removed. Careful hemostasis is most important in getting good results. Most brain tumors are malignant, and the patient is often blind. Whether or not there is fracture of the base or the vault, it is not necessary to operate unless there is compression. A cerebral lesion may be present, even if there is no fracture. The operation of decompression should be used more frequently.

Efficiency and Economics in the Management of the Insane

DR. WILLIAM GORDON, Richmond: Both from the humanitarian and the economic point of view the management of the insane is important. By recent legislation patients may voluntarily be committed to the hospitals without the annoyance of a commission of lunacy. Certain reforms are desirable in our laws. At present warrants may be issued on the statement of irresponsible parties. In toxemias of pregnancy, or uremia, the patients might be pronounced insane. Jails and almshouses are not the place for the insane. I have knowledge of a case of beginning insanity in a young man of prominent family who tried to commit suicide. He was first sent to a private institution, got better, and came home. He had another attack and was confined in jail. Through some intricacy of the law or technicality he was set at liberty, and now he is a menace to the community.

DISCUSSION

DR. TOM A. WILLIAMS, Washington, D. C.: In devising legislation we must have the cooperation of the public. Persons with incipient cases are very unwilling to go to hospitals for the insane. There are several different kinds of early cases: first those in which insight is lost. It is a matter of indifference to these patients where they are removed; second, the excited, maniacal patient detrimental to other people, who must be sent away; third, the patients with insight who are much affected by environment, and whom it would make worse to send to insane hospitals. It is just as hopeless to try to find the causes of surgical diseases in the mortuary as it is to discover causes in far advanced cases, so we must study the incipient cases before destruction has taken place, if we wish to solve the questions. As the patient in incipient cases will not go to the hospital for the insane, we must establish other places.

Alcoholic Injection for Pruritus Ani

DR. H. B. STONE, Baltimore: This method is frankly symptomatic treatment, but gives relief. It destroys the sensory nerve filaments chemically, not surgically. We want to destroy the sensory but not the motor nerves. Alcohol has no selective affinity, and will destroy the motor as readily as the sensory nerve, and thereby produce incontinence. If injection is into the skin itself, it will produce a slough, but if into the subcutaneous fat it will not. In forty patients the results have been exceedingly satisfactory, more than from any other method. Under anesthesia, local or general, the needle is introduced through the skin and then along under the skin, but not too deep, or the motor nerve will be

endangered. If a local anesthetic is used, 90 per cent. grain alcohol is injected: if a general anesthetic is used, 70 per cent.; nothing less than 70 per cent. is effective. We have had two bad sloughs the size of a 10 cent piece or silver quarter, and eight or ten as large as a grain of wheat with no incontinence. If one errs, it should be toward the slough. All patients were completely relieved; one recurred in about a year, and the patient was reinjected. Patients should be kept under observation for about ten days to see if sloughing occurs. There is no trophic disturbance; the slough heals readily.

Dyschylia Gastrica

Dr. Douglas VanderHoof, Richmond: I would suggest dyschylia as a term. Acid gastric secretions have long been regarded as one of the defenses of the body against bacteria. Normal digestion depends, first, on the nerves, and second, on the chemical products of hormone being absorbed and exciting the glandular apparatus of the stomach. Lack of the proper psychic condition may influence such secretion. Partial return of the secretion both of the ferments and of acid has been observed by long treatment with full doses of hydrochloric acid. Achylia may exist in the phlegmatic as well as in the emotional person.

Light as a Cause of Disease

Dr. Thomas W. Murrell, Richmond: Sunlight combines heat and light; the actinic rays may be very destructive. Pigment blocks the progress of light. The negro has not the downy hairs, but has pigment. Excessive bathing may be detrimental to the skin by getting rid of the fatty protective material. So far as I know, no case of skin cancer has ever been reported in a true negro. Milk-crust of children may be a sort of anaphylaxis, with casein as the chief offending agent. Light may be one of the causes of eczema in children with skins already sensitized by dietetic errors.

DISCUSSION

Dr. Mark W. Peyser, Richmond: Excluding white light by substituting red has been of benefit in the treatment of certain skin affections.

Backache and Sciatica, Their Causes and Treatment

Dr. E. E. Feild, Norfolk: Causes of these lesions are: gonorrheal infection, bad teeth, stone in the kidney, stomach ulcer, metabolic affections or subluxation of the sacro-iliac joint. Orthopedic treatment does not obviate dietetic and other medical measures. Manipulation of the sacro-iliac joint under anesthesia is of benefit. Strapping with adhesive as low as the trochanter, but not lower, as this will restrict motion, is a valuable method. It relieves the strain on the back.

DISCUSSION

Dr. John W. Winston, Norfolk: In a case of sciatica I found diacetic acid present, and the trouble was promptly relieved by correcting this.

Dr. Mark W. Peyser, Richmond: I recall a case in which it was difficult to find a cause. The patient did clerical work, and I found that she sat on the edge of a high chair and so compressed the sciatic nerve.

Dr. R. L. Payne, Norfolk: I do not believe that subluxation of the sacro-iliac joint exists. If it did it could not be cured by applying adhesive strips to the soft parts.

Dr. E. E. Feild, Norfolk: It is the stretching of the ligaments that causes the pain. It is not a movement that is perceptible, but enough to cause the pain. In one case the slipping under ether narcosis was very perceptible. As to the strapping, the patients come back and thank you for the relief.

Seminal Vesiculitis

Dr. D. L. Hirschler, Norfolk: The seminal vesicles drain readily in health, but poorly in disease, or not at all. The gonococcus or streptococcus may be found. We should bear in mind how long the gonococcus may remain latent. The sex symptoms are excessive pollutions and frequent erections. Fulness and sense of warmth are present. Vaccines are of no value, and may do harm. The acute cases generally subside into the chronic form.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Ophthalmology, New Rochelle, N. Y.

November, XLV, No. 6

1 Declinations of Vertical Meridians of Retina. G. T. Stevens, New York.—p. 521.
2 Progressive Macular Degeneration in Three Members of Family. M. Feingold, New Orleans.—p. 533.
3 Medical Side of Glaucoma. A. Knapp, New York.—p. 544.
4 Tuberculosis of Retinal Vessels. E. Jackson, Denver.—p. 552.
5 Ocular Anaphylaxis; Reaction to Perfusion with Specific Antigen. A. C. Woods, Philadelphia.—p. 557.
6 Study as to Weight and Percentage of Solids of Cataractous Lenses. C. A. Clapp, Baltimore.—p. 574.
7 Can Development of Myopia Be Arrested and Its Degenerative Changes Be Prevented? Sidler-Huguenin. Zurich.—p. 577.

Archives of Pediatrics, New York

November, XXXIII, No. 11

8 Prognosis and Treatment of Splenic Anemia (Banti's Disease) in Children; Report of Case. E. E. Graham, Philadelphia.—p. 801.
9 Congenital Rigidity of Infancy (Little's Disease); Report of Four Cases. J. S. Wall, Washington, D. C.—p. 812.
10 *Treatmeint of Diphtheria Bacillus Carriers with Special Reference to Staphylococcus Pyogenes-Aureus. A. J. Bell, Cincinnati. —p. 836.
11 *Case of Purpura Fulminans. W. M. Donald, Detroit.—p. 844.

10. **Treatment of Diphtheria Bacillus Carriers.**—Eleven cases are reported by Bell in which he used the method recommended by Schiotz and Page, namely, the application of fresh broth cultures of the *Staphylococcus pyogenes-aureus.* These cases again illustrate the necessity of using a broth culture which is not inert. Eight patients were treated with kaolin. The longest time in obtaining negatives, namely, the beginning of a series of three successive negative cultures, was thirteen days; the shortest time one day; average time a little over six days. The method consisted in spraying the nose and throat every three hours with kaolin powder or eating a half dram of kaolin every hour. The latter seemed to give the better results. Comparing the various methods as outlined by the results enumerated above, the authors may draw the following conclusions: Emphasized in the treatment of diphtheria bacillus carriers, Bell states, that the kaolin treatment, or the various local applications, may be tried first because of their simplicity, especially in private homes, but the desired result is not accomplished as quickly; average time in series over six days. In all probability it is much inferior to the staphylococcus spray in nasal cases. The broth culture of the *Staphylococcus pyogenes-aureus,* when applied properly from a laboratory and clinical standpoint, is a safe and successful method of combating the carrier problem.

11. **Case of Purpura Fulminans.**—A boy, aged 4, who had always been perfectly healthy, was taken with an attack of dysentery, August 7. The attack was a sharp one and demanded very close watching, but the patient recuperated nicely in a week. The stools had been bloody and contained mucus, the fever had been moderate in degree (about 102 F.) and the general condition had been that of a patient suffering with a dysentery of moderate severity. About September 27 he complained of general malaise which was attributed to overeating. He was, however, noticeably pale; the urine was negative. Two days later he had a few ecchymotic spots on the body and lower extremities attributed to injuries. Five days later an ugly looking incisor root was removed. The trauma in the gum continued to ooze slightly and the next day his nose on the right side commenced to bleed. Two days later the boy was very ill, with high fever and general disturbance. Temperature was 104 F., pulse 130, respirations 25, and the body the seat of numerous new ecchymoses. Punctate petechiae were scattered all over the anterior surfaces of both legs, from the thigh to below the knee. The nose bleed was still present and the oozing from the gums still more pronounced.

A diagnosis of purpura fulminans was made. Two doses of horse serum forty-eight hours apart gave complete relief from the hemorrhages, but the patient grew steadily weaker, and the symptoms steadily worse. Delirium supervened within a comparatively few hours, the patient refused nourishment, except in the most limited quantities, the bowels and urine were evacuated involuntarily, the pallor increased, suggesting internal hemorrhages, and the condition grew steadily graver. Some small blood clots were found in the fecal evacuations for the first twenty-four hours but the urine remained clear. Seven days after the onset of the severe symptoms the patient succumbed to a cardiac asthenia. The treatment had been purely symptomatic and expectant. Careful blood examinations had been made, but no blood culture secured.

Arkansas Medical Society Journal, Little Rock

November, XIII, No. 6

12 Eye-Strain; Its Relation to General Health. H. H. Rightor, Helena.—p. 115.
13 Relation of Education in Sexual Union to Eugenics and Conjugal Happiness. C. S. Pettus, Little Rock.—p. 118.
14 Cesarean Section Procedure of Election—Less Danger to Mother and Child When Interference Is Required to Effect Delivery; Report of Three Cases. W. Cantrell, Greenville, Texas.—p. 121.

American Journal of Anatomy, Philadelphia

November, XX, No. 3

15 Equivalence of Different Hematopoietic Anlages. (By Method of Stimulation of Their Stem Cells). V. Danchakoff, Philadelphia.—p. 255.
16 Morphologic and Microchemical Variations in Mitochondria in Nerve Cells of Central Nervous System. N. C. Nicholson, Baltimore.—p. 329.
17 Development of Atrial Septum and Valvular Apparatus in Right Atrium of Pig Embryo; Fenestration of Anterior Cardinal Veins. C. V. Morrill, New York.—p. 351.
18 Origin of Sex-Cords and Definitive Spermatogonia in Male Chick. C. H. Swift, Chicago.—p. 375.
19 Morphogenesis of Follicles in Human Thyroid. E. H. Norris, Minneapolis.—p. 411.
20 Effects of Low Temperature on Development of Fundulus. W. E. Kellicott, Woods Hole, Mass.—p. 449.
21 Development of Spiral Coil in Large Intestine of Pig. P. E. Lineback, Boston.—p. 483.

Boston Medical and Surgical Journal

November 23, CLXXV, No. 21

22 Physically Defective. E. O. Otis, Boston.—p. 737.
23 Fractures in Base Hospital. F. A. Coller, Los Angeles.—p. 741.
24 Speculations Regarding Pancreas and Metabolism in Diabetes. H. P. Greeley, Waukesha, Wis.—p. 753.
25 Three Cases of Typhus. M. G. Berlin, Dorchester.—p. 755.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

November, IX, No. 5

26 Summer Diarrhea and Vomiting of Childhood. C. R. Austrian, Baltimore.—p. 72.
27 Thermometer in Diagnosis of Active Pulmonary Tuberculosis. J. Girdwood, Baltimore.—p. 74.

Journal of Biological Chemistry, Baltimore

November, XXVII, No. 2

28 Relation of Oxidase Reactions to Changes in Hydrogen Ion Concentration. G. B. Reed, Cambridge, Mass.—p. 299.
29 *Phosphatids in Ductless Glands. F. Fenger, Chicago.—p. 303.
30 Nutrition and Evolution. J. Loeb and J. H. Northrop, New York.—p. 309.
31 Influence of Parturition on Composition and Properties of Milk and Milk Fat of Cow. C. H. Eckles and L. S. Palmer, Columbia, Mo.—p. 313.
32 *Method for Determination of Nitric Nitrogen. F. M. Scales, Washington, D. C.—p. 327.
33 Mechanism of Diffusion of Electrolytes Through Membranes of Living Cells. Necessity of General Salt Effect on Membrane as Prerequisite for Diffusion. J. Loeb, New York.—p. 339.
34 Id. Diffusion of Potassium Chlorid out of Egg of Fundulus and Relative Efficiency of Different Ions for Salt Effect. J. Loeb, New York.—p. 353.
35 Id. Analogy of Mechanism of Diffusion for Acids and Potassium Salts. J. Loeb.—p. 363.
36 Fate of Alkali Blue in Organism. S. Kuriyama, New Haven, Conn.—p. 377.
37 *Experimental Studies on Growth. Influence of Diet Deficient in Fats, and of Same Diet with Cholesterol Added. T. B. Robertson, Berkeley, Calif.—p. 393.
38 Physiologic and Pharmacologic Studies on Coal Tar Colors. Experiments with Fat Soluble Dyes. W. Salant and R. Bengis, Washington, D. C.—p. 403.
39 Electrically Heated Vacuum Desiccator. T. B. Robertson and C. L. A. Schmidt, Berkeley, Calif.—p. 429.
40 Oxidation of Branched Chain Fatty Acids. Action of Hydrogen on Homologues of Isobutyric Acid. P. A. Levene and C. H. Allen, New York.—p. 433.
41 Mechanism of Cholesterol Absorption. J. H. Mueller, New York.—p. 463.
42 *Pancreatic Diabetes in Dog. Influence of Alkali and Acid on Glycosuria and Hyperglycemia. J. R. Murlin and B. Kramer, New York.—p. 481.
43 *Id. Is Glucose Retained When Sodium Carbonate Is Administered to Depancreatized Dogs Deposited as Glycogen? B. Kramer, J. Marker and J. R. Murlin, New York.—p. 499.
44 Id. Influence of Alkali on Respiratory Metabolism After Total and Partial Pancreatectomy. J. R. Murlin and B. Kramer, New York.—p. 517.

29. **Phosphatids in Ductless Glands.**—The pituitary body and the suprarenals, as well as the pineal, the infant thymus and the corpus luteum of pregnancy, Fenger says, contain considerable amounts of phosphatids in excess of ordinary muscle tissue, indicating that the phosphatids play some part in the internal chemistry of these ductless glands. The thyroid does not contain any more phosphatids than straight lean meat, and it may, therefore, be assumed that this gland performs its secretory functions independent of the phosphatids.

32. **Determination of Nitric Nitrogen.**—Scales claims that his method is accurate and requires only the simplest modification of the regular Kjeldahl apparatus. A zinc-copper couple is prepared in such a way that it can be renewed very easily. This couple decomposes water at the boiling point. The hydrogen is evolved and the oxygen of the water combines with the zinc to form zinc oxid. The advantage in the use of this couple is that neither an acid nor an alkaline reaction is necessary to promote the generation of hydrogen. Therefore only a small amount of fixed alkali is required to expel the ammonia formed by the reduction. The procedure is described in detail.

37. **Influence of Diet Deficient in Fats, and of Same Diet with Cholesterol Added.**—A diet composed of boiled and mashed potatoes, defatted bran and white of egg, with the addition of small amount of chlorophyll and ferric chlorid, when fed to mice 4 or 5 weeks of age, Robertson found leads to initial loss of weight followed by resumption of a retarded growth. Ultimately, however, a sharp decline in weight occurs, accompanied by marked hyperirritability of the skin and terminated by death. The addition of cholesterol to the above diet prevents the initial loss of weight, but does not otherwise improve the welfare of the animals, the average duration of life of the animals receiving cholesterol being actually less than that of the animals which do not receive cholesterol.

42. **Influence of Alkali and Acid on Glycosuria and Hyperglycemia.**—Sodium bicarbonate and potassium bicarbonate administered by stomach tube may be without immediate effect on the glycosuria and the hyperglycemia of the depancreatized dog. A bicarbonate given by mouth to a fasting depancreatized dog may even cause the reappearance of glucose in the urine after it had been "starved out." The normal anhydrous salt of sodium, sodium carbonate, may, on the contrary, reduce the sugar in the urine materially when given by the month, and when given by vein invariably does so, especially when added to Ringer's or Locke's solution to the amount of about 1 per cent. The blood sugar does not undergo a compensating increase in percentage even when the dilution of the blood is accounted for. Dilute hydrochloric acid given by mouth or subcutaneously to the depancreatized dog has just the opposite effect of alkali—increasing the sugar in the urine without affecting materially the nitrogen elimination—and without causing any effect on the blood.

43. **Disposition of Sodium Carbonate in Depancreatized Dogs.**—It is tentatively suggested by the authors that (1) glucose retained as a result of the administration of sodium carbonate to depancreatized dogs is not held back as glycogen, and (2) the sugar is not excreted by way of the saliva, stomach, or small intestine.

Journal of Laboratory and Clinical Medicine, St. Louis

November, II, No. 2

45 *Lipin Content of Liver in Two Cases of Dyspituitarism. A. S. Warthin, Ann Arbor, Mich.—p. 73.
46 Employment of Closed Ether Anesthesia for Ordinary Laboratory Experiments. D. E. Jackson, St. Louis.—p. 94.
47 Diagnosis of Cancer. M. Kahn, Pittsburgh.—p. 103.
48 Utilization of Dextrose in Animal Body. J. J. R. Macleod, Cleveland.—p. 112.
49 Pituitary Standardization. H. C. Hamilton and L. W. Rowe, Detroit.—p. 120.
50 Review of Folin and Denis Methods for Determination of Nitrogen by Direct Nesslerization. R. G. Pearce, Cleveland.—p. 130.
51 *Urinalysis in Relation to Renal Lesions. J. R. Stark, Cincinnati. —p. 134.
52 Technic for Staining Blood, Especially for Plasmodia. W. Krauss, Memphis, Tenn.—p. 138.
53 Convenient Electric Supply System for Physiology Laboratory. C. McPeek, C. I. Reed and F. Beck, Columbus.—p. 139.

45. **Lipin Content of Liver in Dyspituitarism.**—In hypopituitarism there is a peculiar obesity due to infiltration of various cells of the body with a mixture of lipins—glycerin esters and cholesterol esters. This condition of cholesterol liposis is especially marked in the liver and suprarenals, but is scattered all over the body With deficiency of hypophysis function there appears to be associated a cholesterol retention or infiltration. Hypopituitarism must, therefore, be classed among the xanthelasmic conditions, and is related in kind to diabetic liposis and Gaucher's disease. The hypophysis is either directly or indirectly concerned with lipin metabolism, particularly with cholesterol steatosis. Postmortem hyperpyrexia may be associated with hypopituitarism and the obesity resulting from the latter condition. In the livers of two cases of hypopituitarism examined by Warthin there occurred a peculiar intraperipheral zonal necrosis, unlike all previously described forms of zonal liver necrosis. Associated with this necrosis is a reparative fibroblastic proliferation, giving rise to the picture of an early intralobular cirrhosis. The relationship of this hepatic change to the hypophysis conditions remains to be shown.

51. **Urinalysis in Relation to Renal Lesions.**—The relation between urinalysis, the clinical diagnosis of nephritis, which is so frequently directly based on urinary findings, and the anatomic changes in the kidneys was investigated by Stark. The material consisted of 600 clinical histories in connection with which the term nephritis was used in the clinical diagnosis. The clinical history, necropsy protocols, gross material and microscopic preparations were available for study. The term nephritis was often used with such apparent lack of interest or understudy that very frequently there was no clear clinical data to warrant it. For this reason the number of cases useful for investigation reduced itself to 100, and to obtain even this number it was necessary to include those in which the clinical history included such terms as "albumin present," "blood and pus," or "albumin and casts." These 100 cases were divided into three groups: 1. Those in which the clinical and anatomic diagnosis did not agree, 26. 2. Those in which the clinical and anatomic diagnosis agreed, 37. 3. Those in which there was no clinical diagnosis, but in which the clinical data indicated some renal abnormality, 37. Group 1: Nine cases were clinically diagnosed as chronic diffuse nephritis, whereas at the postmortem table they proved to be acute. Seven were just the reverse. In five cases the kidneys were tuberculous. The clinical diagnosis in two of these was acute nephritis; in two, chronic nephritis, and in one, cystitis. There were five other cases belonging in this group. One was diagnosed clinically as tuberculous nephritis and proved to be carcinoma of the kidney; two were clinically acute parenchymatous and anatomically diagnosed as "nephritis" and proved to be chronic diffuse nephritis.

Group 2. Only fourteen out of these thirty-seven cases showed the typical analysis which could warrant its being an aid in the diagnosis. In the other cases the chief factor which was at variance was the specific gravity. In cases in which it was given, it was almost invariably too high by quite a wide margin. In only a few of the sixty-three cases was albumin absent and yet its presence in large amounts was not an indication of the amount of renal damage. The converse proved to be equally correct. Also leukocytes or "pus" are not found where most expected. In five cases showing infarction, acute interstitial nephritis or "surgical kidneys" the urine was free from white blood cells, while in two others in which the report was, "quantities of pus," and the clinical diagnosis cystitis, the postmortem examination revealed pyonephritis. Hence, Stark says, a urinary examination is of as little value, in itself, as a leukocyte count, a Wassermann, a gastric analysis, or other laboratory procedures without other data, and that in the differential diagnosis of kidney lesions the urinary picture is of practically no importance.

Journal of Medical Research, Boston

November, XXXV, No. 2

54 Spontaneous Infection in Guinea-Pig. W. L. Holman, Pittsburgh. —p. 151.
55 *Hyaline Degeneration of Arteries. F. M. Jacob, Pittsburgh.—p. 187.
56 *Sugar Content of Blood and Spinal Fluid of Insane Subjects. P. G. Weston, Warren, Pa.—p. 199.
57 *Etiology of Scarlet Fever. F. B. Mallory and E. M. Medlar, Boston.—p. 209.
58 *Oxidizing Ferment of Myelocyte Series of Cells and Its Demonstration by Alphanaphthol Pyronin Method. G. S. Graham, Boston.—p. 231.
59 Pathology, Bacteriology and Serology of Coccidioidal Granuloma; Report of Two Cases. W. T. Cummins and J. Sanders, San Francisco.—p. 243.

55. **Hyaline Degeneration of Arteries.**—The aorta and its large branches and the arteries of the kidney, spleen, uterus and ovary were examined by Jacob. In each case the group of organs was examined to observe the earliest beginning of hyaline change, as well as to determine the tissues most frequently attacked. Jacob found hyalin a common evidence of degeneration of the arteries, and although it may be observed in all three coats, the intima is most commonly affected. The hyalin of arteries is of two kinds. On the one hand it appears as a degenerative process of connective tissue, under which circumstances nutritional changes of the vessel wall appear to be the important factor of its occurrence. This type is seen in the intimal thickenings of the aorta and arteries of the elastic type, as well as in the unique hyperplasia of the intima in the arteries of the uterus after pregnancy. On the other hand, hyalin also appears as a homogeneous bandlike deposit simulating a cellular secretion and closely allied to amyloid. These deposits may be found about capillaries (ovary, kidney) and beneath the endothelium of the smaller arterioles of the ovary, spleen, kidney and uterus. Jacob suggests that it is probable that the hyaline masses appearing in the glomeruli of the human kidney (distinguished from the hyaline changes in glomerular fibrosis) are of the nature of tissue secretions primarily appearing in a semifluid state, later forming insoluble colloid deposits. This is also the probable mode of origin of the hyalin appearing in bandlike masses in the arterioles of the ovary, spleen and uterus. Under all conditions the presence of hyalin in the arteries demonstrates retrogressive changes in the vascular tissues.

56. **Sugar Content of Blood and Spinal Fluid of Insane.**—Blood and spinal fluid from each of a series of individuals were examined by Weston for sugar by the method of Myers and Bailey. The series includes twenty cases of dementia praecox, ten of manic depressive insanity, twenty of paresis, six of epilepsy and nine of imbecility. The ratio of sugar found in the spinal fluid to that found in the blood varied from 1 to 1.55 in the epilepsy group to 1 to 1.72 in the general paralysis group. Individual differences are quite considerable, especially in the dementia praecox group, but the averages for the different groups show no considerable deviation from normal.

57. **Etiology of Scarlet Fever.**—A gram-positive bacillus was found by Mallory and Medlar in the tissues of eight persons dying of scarlet fever and in the smears and cultures made from the tonsils, soft palate, pharynx and nasopharynx of sixty patients. Therefore, the authors believe that it seems reasonable to infer that scarlet fever may be due to a strongly gram-positive bacillus (*B. scarlatinae*) which is usually much less virulent than the diphtheria bacillus, but which, as a rule, infects primarily the same localities, the tonsils and pharynx, and in severe cases may extend in the same way to adjoining tissues, namely, the nasopharynx,

larynx, trachea, bronchi, lungs and esophagus. The toxin causes necrosis of the lining epithelium and occasionally of the deeper tissues and leads to an exudation of serum and polymorphonuclear leukocytes. Fibrin formation is usually slight or absent, so that the lesions often appear as shallow erosions or rarely as distinct ulcerations, but sometimes is fairly abundant, especially in the larynx and trachea and forms a definite membrane of moderate thickness.

In uncomplicated fulminating cases of scarlet fever the causative agent is present in large numbers in the lesions in the respiratory tract up to the time of death, but in milder cases the micro-organism seems as a rule to die out quickly in the lesions it has caused, so that after the second or third day following the eruption it is difficult or impossible to demonstrate it. But under certain conditions the bacilli may persist for days or weeks in certain situations, for example, in ulcerations in the tonsils, pharynx, larynx, or esophagus, or in the bronchi, so that the patients harboring them becomes scarlet fever carriers. Secondary infection with streptococci is common, and death in some instances at least may be due to them rather than to the bacillus of scarlet fever. The eruption of the skin and the acute tubular nephritis are probably of toxic origin, due to the elimination of a toxin produced by the causal agent of the disease.

58. **Oxidizing Ferment of Myelocyte.**—The granules of leukocytes and myelocytes contain an oxidizing enzyme of peroxidase type. This enzyme and the granules bearing it, Graham says, can be demonstrated readily in blood smears or in tissues by treatment with an alphanaphthol solution containing small amounts of hydrogen peroxid. Blood smears treated with the alphanaphthol solution followed by pyronin and methylen blue present a picture much like that given by the Romanowsky stains. The granules of leukocytes and myelocytes are, however, much more definitely indicated. In frozen sections, stained with a mixture of the alphanaphthol solution and pyronin and counterstained with hematoxylin, the granule bearing cells are sharply differentiated. The sections can be cleared and mounted in balsam. Graham suggests that the method for blood smears should prove of value in the identification of myelocytes and particularly of the early forms of these cells, such as occur in case of acute leukemia.

Journal of Nervous and Mental Disease, Lancaster, Pa.

November, XCIV, No. 5

60 *Diffuse Sarcoma of Pia Enveloping Entire Cord. P. Bassoe, Chicago, and C. L. Shields, Salt Lake City.—p. 285.
61 *Syringo-Encephalia, Syringo-Encephalomyelia. Function of Pyramidal Tract. W. G. Spiller, Philadelphia.—p. 395.
62 *Anosmia and Sellar Distention as Misleading Signs in Localization of Cerebral Tumor. H. Cushing, Boston.—p. 415.
63 *Diagnosis of Subacute Combined Sclerosis of Spinal Cord Associated with Severe Anemia. W. B. Cadwalader, Philadelphia.—p. 434.

60. Abstracted in THE JOURNAL, June 10, 1916, p. 1888.

61. **Syringo-Encephalia.**—On the basis that the terms syringomyelia and syringobulbia are inadequate to express the extensive implication of the central nervous system that syringomyelia may assume, Spiller proposes the term syringoencephalia, or for a still more general disorder, when both brain and cord are affected, syringo-encephalomyelia.

62. Abstracted in THE JOURNAL, June 10, 1916, p. 1886.

63. Abstracted in THE JOURNAL, June 17, 1916, p. 2035.

Journal of Parasitology, Urbana, Ill.

September, III, No. 1

64 Parasitic Protozoa. Myxosporidia from Japan; Three New Species. R. Kudo, Yokyo.—p. 3.
65 *Two Free Living Larval Trematodes from North America. H. B. Ward, Urbana.—p. 10.
66 *Anatomy and Relationships of Some North American Trematodes. H. W. Stunkard, Urbana.—p. 21.
67 Dauercystformation of Trichomonas Intestinalis. K. M. Lynch, Charleston, S. C.—p. 28.
68 Two Cestodes from Spotted Sting-Ray. E. Linton.—p. 34.
69 Case of Ascaris Triquetra Schrank in Dogs. A. C. Walton, Boston.—p. 39.

65. **Free Living Larval Trematodes.**—Ward describes the structure and activity of two new cercariae of peculiar type captured free in Lake Erie and Lake St. Clair. They are designated *Cercaria anchoroides nov. spec.* and *C. gorgonocephala nov. spec.*, and are compared with known European species.

66. **Anatomy of Some Trematodes.**—Extended study of North American representatives of the three trematode families, *Polystomidae, Aspidogastridae* and *Paramphistomidae* has made possible the first comprehensive treatment in this country of their structure and classification. Stunkard adds four new species to the genus *Polystoma* and three new species of two new genera to the *Paramphistomidae.*

Medical Record, New York

November 18, XC, No. 21

70 Crucial Age of Man. W. S. Gleason, Newburgh.—p. 881.
71 Mental Hygiene. H. M. Friedman, New York.—p. 884.
72 Treatment of Mercurial Stomatitis. D. W. Montgomery, San Francisco.—p. 889.
73 Care of Digestion. M. Einhorn, New York.—p. 893.
74 Ambulatory Types of Thyroid Disease. E. Bertine, New York.—p. 895.
75 Congenital Club-Foot. I. Reitzfeld, New York.—p. 897.
76 Four Years' Study of Kelling Hemolytic Test. B. G. R. Williams, Paris, Ill.—p. 898.
77 Autointoxication from Chronic Intestinal Stasis, Due to Hypertrophy of Sphincter Ani, Simulating Appendicular Colic. A. A. Landsman, New York.—p. 901.

New York Medical Journal

November 18, CIV, No. 21

78 Birth Control. S. A. Knopf, New York.—p. 977.
79 Compression Fracture of Fifth Lumbar Vertebra. J. K. Young, Philadelphia.—p. 982.
80 Diagnosis of Duodenal Ulcer. A. E. Austin, Boston.—p. 984.
81 Value to Operating Surgeon of Thorough Understanding of Therapeutic Agents. A. Vanderveer, Albany.—p. 988.
82 Puerperal Sepsis. A. M. Judd, New York.—p. 991.
83 Surgical Staff Conference. F. E. Adair, New York.—p. 996.
84 Testicular Syphilis. M. Zigler, New York.—p. 998.
85 Female Medical Clinic. M. H. Kahn, New York.—p. 1000.
86 Spinal Fluid of Normal Children. O. H. Petty, Roxborough, Pa.—p. 1004.
87 Public Health. H. Greenstein, New York.—p. 1004.

Northwest Medicine, Seattle

November, XV, No. 11

88 Physician as Business Man. T. O. Boyd, Twin Falls, Ida.—p. 353.
89 Case of Splenic Enlargement. G. A. Dowling, Seattle.—p. 355.
90 Malaria with Special Reference to Surgical Spleen. J. H. Bristow, Portland, Ore.—p. 359.
91 Mechanical Intestinal Obstruction. W. B. Holden, Portland, Ore.—p. 361.
92 Résumé of Present Status of Gallbladder Surgery. J. A. Pettit, Portland, Ore.—p. 365.
93 Indications and Contraindications for Cholecystectomy. M. H. Tallman, Boise, Ida.—p. 367.
94 Fibrosis of Bladder Neck as Cause of Urinary Frequency. H. W. Howard, Portland, Ore.—p. 368.
95 Multiple Peptic Ulcer in Child Aged Ten Years. G. F. Koehler, Portland, Ore.—p. 373.

Pennsylvania Medical Journal, Athens

October, XX, No. 1

96 Asphyxiation and Suffocation. E. B. Bricker, Harrisburg.—p. 3.
97 Laws of Pennsylvania Relating to Industrial Hygiene. F. D. Patterson, Harrisburg.—p. 6.
98 Lead Poisoning. F. D. Patterson, Harrisburg.—p. 13.
99 Workmen's Compensation Law as It Affects Physician. P. N. Furman, Harrisburg.—p. 15.
100 Relation of Extreme Temperatures to Efficiency of Workman. A. Stengel, Philadelphia.—p. 28.
101 Mortality from Diseases of Lungs in American Industry. F. S. Crum, Newark, N. J.—p. 33.
102 Value of Physical Examination as Factor in Prevention of Industrial Injury. J. B. Lowman, Johnstown.—p. 48.
103 What Constitutes "Reasonable" Surgical, Medical and Hospital Services Under Compensation Act? J. M. Baldy, Philadelphia.—p. 55.
104 Inguinal Hernia; Viewed as Anatomic Defect. C. A. Lauffer, Wilkinsburg.—p. 61.
105 Business Features of Medical Society of State of Pennsylvania. C. A. E. Codman, Philadelphia.—p. 63.

Southern Medical Journal, Birmingham, Ala.

November, IX, No. 11

106 Teaching and Practice. W. S. Thayer, Baltimore.—p. 955. To be continued.
107 *Medical Treatment of Gastric and Duodenal Ulcers. S. Harris, Birmingham.—p. 960.

108 Case of Syringomyelia Morvan Type in Negro. W. H. Deaderick, Hot Springs, Ark.—p. 971.
109 Importance of Counting Pus Cells in Urine. E. B. Block and K. Nyun, Atlanta, Ga.—p. 972.
110 Exact Estimation of Complement in Wassermann Technic. J. S. Fleming, Memphis, Tenn.—p. 973.
111 Iodin in Typhoid. J. Kenan, Selma.—p. 976.
112 Intussusception in Acute Intestinal Obstruction; Report of Case Occurring with Round Worms. A. McGlannan, Baltimore.—p. 977.
113 Craigiasis. H. B. Hiatt, High Point, N. C.—p. 979.
114 Chronic Arthritis; Report of Case. G. T. Tyler, Greenville, S. C.—p. 983.
115 Prostatectomy. A. M. Shipley and F. S. Lynn, Baltimore.—p. 985.
116 Prevention of Postoperative Gas Pains. D. W. Queen, Temple, Texas.—p. 988.
117 Chronic Osteomyelitis and Its Operative Treatment. A. Jacoby, Dallas, Texas.—p. 989.
118 Chronic Laryngeal Stenosis; Report of Two Cases. P. S. Mertins, Montgomery.—p. 992.
119 Syphilitic Keratitis. W. D. Hicks, San Antonio, Texas.—p. 994.

107. Medical Treatment of Gastric and Duodenal Ulcers—Harris has simplified, modified and Americanized the Lenhartz diet so that it can be carried out with greater accuracy by the average nurse or attendant than that which was originally advised. The nurse prepares enough of a mixture in the proportion of one egg and 1½ ounces of cream to 4 ounces of milk and gives it every hour from 7 a. m. to 7 p. m., in gradually increasing quantities, beginning with ½ ounce the first day and increasing ½ ounce each day. It requires six days to get up to 3 ounces at each feeding, and the quantity is kept at 3 ounces for four days. From the seventh to the tenth day a soft cooked egg and two tablespoonfuls of strained oatmeal may be given with the feeding at 7 a. m. and 7 p. m., and at 1 p. m. two tablespoonfuls of scraped beef lightly broiled and two tablespoonfuls of thoroughly cooked rice with butter. After ten days until the fifteenth day, 3 ounces of the egg, milk and cream mixture are given at 9 and 11 a. m. and 3 and 5 p. m.; and 2 ounces of strained oatmeal with cream and sugar, and one or two thin slices of dry toast and two soft eggs for breakfast at 7 a. m. and supper at 7 p. m.; and chopped or minced chicken or scraped beef, dry toast, rice and ice cream or gelatin at 1 p. m. Butter is allowed after ten days. Beginning with the fifteenth day and for two months, the patient should have small meals three times a day, with an egg and goblet of milk between meals and at bedtime. Harris says that this diet may be begun in forty-eight hours after a hemorrhage and in three or four days after a gastro-enterostomy. In the meantime the patient may receive some nourishment by the rectum. After the sixth week and for a year after treatment the ulcer patient should follow the diet indicated in hyperchlorhydria.

Wisconsin Medical Journal, Milwaukee

November, XV, No. 6

120 Operation of Cranial Decompression for Certain Intracranial Conditions. W. Sharpe, New York.—p. 173.
121 Acute Appendicitis. K. Doege, Marshfield.—p. 183.
122 Hereditary Syphilis from Modern Standpoint. C. A. Baer, Milwaukee.—p. 189.
123 Provision for Medical Care Under Health Insurance. A. Lambert, New York.—p. 191.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, Liverpool

September, X, No. 2

1 *Experimental Researches on Bacteriology of Leprosy. R. Stanziale.—p. 165.
2 Sudanese Maduromycosis. A. J. Chalmers and R. G. Archibald.—p. 169.
3 Sudanese Actinomycosis. A. J. Chalmers and J. B. Christopherson.—p. 223.

1. Experimental Researches on Bacteriology of Leprosy.—This is a brief account of the results of Stanziale's experiments in connection with the bacteriology of leprosy, which were begun in 1911. Two rabbits were inoculated into the anterior chamber of the eye with small pieces of a leprous nodule on Aug. 16, 1911. December 3, the cornea was incised and a microscopic examination having shown numerous acid-fast micro-organisms, four other rabbits were inoculated in the same fashion with small pieces taken from the first two animals; in two the inoculation was followed by the production of corneal and iritic nodules. With material from these animals, three other rabbits were inoculated, this being, therefore, the third transplantation or transmission. Two failed to show any permanent lesions, but the third rabbit developed in the course of three months a small gray nodule at the site of the graft, which was surrounded by several minute gray and pink granules which spread over the iris, in addition to a cloudy area on the cornea in the region of the inoculation. This opacity showed very clearly numerous arterioles, which, taking their origin from the outer hazy margin, reached the center of the cloudy oval patch. These lesions gradually disappeared after two months' time, and eventually the only traces to be detected consisted in deformity of the pupil with adhesions, diminution of the anterior chamber and localized opacity of the cornea.

After these initial experiments many attempts have been made with material from eight lepers and numerous rabbits. The leprotic lesions were successfully transferred from the first to the second and third generation, but by no means with uniform results. Numerous and repeated attempts were made to obtain an artificial culture of the bacterium of leprosy on laboratory mediums, but all efforts, with one single exception, were sterile, though many different mediums were employed, both aerobically and anaerobically. Once only, from a rabbit which had been inoculated 128 days previously, Stanziale succeeded in isolating an acid-fast micro-organism, identical in its morphology with Hansen's bacillus, and which he considers to be similar to the bacterium cultivated by Kedrowsky from human lepromas. The culture was obtained on a single tube of egg-yolk agar which was anaerobically incubated during a month at 37 C. White mice, guinea-pigs rabbits and two monkeys have been subcutaneously and intraperitoneally injected with emulsions of this culture, but so far only temporary, localized lesions have been obtained, if at all.

British Medical Journal, London

November 4, II, No. 2914

4 *Possible Functions of Cerebrospinal Fluid. W. D. Halliburton.—p. 609.
5 Incidence and Treatment of Entamœba Histolytica Infection at Walton Hospital. C. Dobell.—p. 612.
6 Some Examinations and Treatments for Entamœba Histolytica Infections. M. W. Jepps.—p. 616.
7 Search for Dysentery Carriers Among Soldiers Coming from Gallipoli and Egypt. J. O. W. Barratt.—p. 617.
8 Case of Jaundice from Trinitrotoluol Poisoning. H. Thursfield.—p. 619.

November 11, No. 2915

9 Pyrexia or Trench Fever. J. Muir.—p. 641.
10 Case of Acute Myeloblastic Leukemia. R. Hill.—p. 645.
11 *Grafting with Frog Skin. H. W. M. Kendall.—p. 646.
12 *Use of Glycerin and Ichthyol in Treatment of Septic Wounds. T. W. A. Daman.—p. 646.

4. See *Lancet*, abstract No. 13.

11. Grafting with Frog Skin.—Fourteen cases are cited by Kendall in which he resorted to this method of grafting. The ideal wound to graft is flat, without much suppuration or excessive protuberant granulations. The rapidity with which the wound commences to heal after the graft has successfully adhered is in marked contrast to its sluggishness before the operation. The wound having been gently cleaned without antiseptics and as gently dried, the loose skin on the inner side of the frog's thigh is carefully pinched up in a pair of dressing forceps, snipped off with scissors, spread out and applied by its under surface to the wound. A strip of gutta-percha tissue smeared with some mild and soft nonirritating emollient is then placed over it, fixed in position at its ends by adhesive plaster, and a dry dressing applied over all. The whole is gently removed in three days, when the site of the graft will be noticed as a purplish spot branching outward to the periphery of the wound. A similar dressing is again applied for two days to avoid unnecessary interference, after which the wound may be dressed daily, without the gutta-percha tissue, with some simple, nonirritating ointment, such

as boracic acid, until healing is completed. The gap in the skin's continuity is by this process filled up and unsightly or inconvenient contraction avoided. In addition to leaving a supple scar, this method is said to have the advantage of transplanting skin free of hair, and is free of diseases possibly conveyed in human skin. No antiseptics are used so as to avoid destroying the delicate epithelium formed from the graft.

12. **Glycerin and Ichthyol in Treatment of Septic Wounds.**—Daman endorses the use of a mixture of ichthyol and glycerin in varying strengths as first suggested by Duggan in every case of an open wound, accompanied by sepsis, induration and pain.

Lancet, London

November 4, II, No. 4862

13 *Possible Functions of Cerebrospinal Fluid. W. D. Halliburton.—p. 779.
14 *Cases of Kala-Azar in Europeans Successfully Treated by Intravenous Injections of Tartar Emetic. L. Rogers.—p. 782.
15 Dental Disease in Nursing Women. H. Waller.—p. 785.
16 Massage and Medical Electricity in After-Treatment of Convalescent Soldiers. F. B. Lambert.—p. 788.
17 Ultraviolet Radiation from Tungsten Arc. W. J. Turrell.—p. 790.
18 Case of Fractured Scaphoid and Os Magnum in Boy Ten Years Old. C. Gouldesbrough.—p. 792.
19 Pregnancy Complicated by Increased Cerebrospinal Pressure. N. Gray.—p. 792.

November 11, No. 4863

20 *Exophthalmic Goiter. H. Mackenzie.—p. 815.
21 Rose Irrigator for Supplying Therapeutic Fluid Continuously and at Standard Temperatures to Whole Surface of Wound. A. E. Wright, H. H. Tanner and R. C. Matson.—p. 821.
22 *Bacteriology of Feces in Diarrhea of Infants. W. R. Logan.—p. 824.
23 *Improved Operation for Intrinsic Malignant Disease of Larynx. H. L. Lack.—p. 827.
24 Origin and Prevention of Cerebrospinal Fever. H. Sutherland.—p. 828.

13. **Possible Functions of Cerebrospinal Fluid.**—The thesis in which Halliburton feels there is some truth is to regard the cerebrospinal fluid as the perfect physiologic medium more perfect doubtless than the artificial fluids made in the laboratory, but in its essential features closely resembling those associated with the names of Ringer and Locke.

14. **Tartar Emetic in Kala-Azar.**—The results obtained by Rogers in eighteen consecutive cases are as follows: cured, 13; greatly improved, 12; improved 12. One patient died from phthisis after the kala-azar parasite had disappeared from his spleen.

20. **Exophthalmic Goiter.**—Briefly, Mackenzie's views on the operative treatment of exophthalmic goiter are: If dope at all, operation should be performed under local anesthesia. Local anesthesia is specially indicated in younger subjects. Ligature of the thyroid arteries does not appear to have any appreciable effect on the disease, and therefore, if done at all, it should only be as a forerunner of thyroidectomy. Thyroidectomy does not cure unless a sufficient amount of gland is removed. If possible it is better to remove more than an entire lobe at one operation. Mackenzie does not think the risk will be appreciably increased if this is done. If a whole lobe is left behind it is probable that another operation will be necessary at a later time, unless by means of other treatment a sufficient reduction of the remaining lobe can be brought about.

22. **Bacteriology of Feces in Diarrhea of Infants.**—The flora of artificially fed infants Logan found differs from that of breast-fed infants chiefly in a decrease of the acid tolerant group, an increase of the normal *B. coli* group, and in the appearance of members of the nonlactose fermenting group along with some increase of cocci. The flora of infants suffering from diarrhea shows similar but more marked changes, and the more severe the diarrhea the more marked the changes. Logan suggests that it is probable that the acid tolerant group exerts a beneficent influence in restraining the growth in the intestine of the nonlactose fermenting group. Bacilli of the nonlactose fermenting group were obtained from 6 out of 21 (28.5 per cent.) infants and young children who were free from diarrhea. Bacilli of this group were isolated from 11 out of 14 cases of diarrhea (78.5 per cent.). Bacilli of Morgan's No. 1 group were isolated from 9 per cent. of the normal children, and from 35 per cent. of the cases of diarrhea. True, though nonagglutinable, dysentery bacilli were isolated from none of the normal children, but were obtained from three cases of diarrhea with blood and mucus (dysentery), or 21 per cent. of total diarrhea cases. A certain number of cases of diarrhea of infants are therefore true bacillary dysenteries, Logan thinks. It is doubtful whether the overgrowth of nonlactose fermenting bacilli initiates the diarrhea, or whether it is a secondary and aggravating factor.

23. **Operation for Intrinsic Malignant Disease of Larynx.**—The steps of Lack's operation are briefly as follows: The larynx and the upper rings of the trachea are exposed through the usual vertical median incision and a tracheotomy tube is inserted. Then the soft tissues and perichondrium are turned off the thyroid cartilage on the affected side; the cricothyroid membrane and the ring of the cricoid are laid bare. Next, if desired, thyrotomy is performed by splitting the thyroid cartilage in the median line in the usual way. By gentle traction on the margins of the opening thus made the interior of the larynx can be inspected and the nature and extent of the growth seen. With strong cutting forceps the growth, with a sufficient margin of healthy tissue, is now cut away, together with the overlying cartilage in one piece. The thyrotomy is not always necessary. When it is known that the growth is malignant and that it is limited to one vocal cord there is no need to split the thyroid. With a small saw the thyroid cartilage is divided in the median line from its lower edge upward nearly to the upper margin. A transverse incision is then carried backward just below the upper edge of the thyroid, nearly to the posterior border, and then downward just in front of the posterior border. The square piece of cartilage thus marked out is removed, and subsequently the larynx is opened by dividing the underlying soft parts.

Medical Journal of Australia, Sydney

October 7, II, No. 15

25 Diathermy; Its Use in Surgery. W. K. Hughes.—p. 289.
26 *Acute Renal Infection in Pregnancy and Puerperium. S. H. Harris.—p. 291.
27 Medical Notes on Troops from Australia Landing at Suez. F. Lovegrove.—p. 294.
28 Case of Fractured Base of Skull with Compression Symptoms. A. J. J. Triado.—p. 295.

October 14, No. 16

29 *Etiology of Congenital Mental Deficiency. W. A. T. Lind.— p. 313.
30 Color and Its Relation to Tune. G. H. Taylor.—p. 316.
31 Case of Multiple Abscesses of Kidney Originating in Obstetric Trauma. R. Worrall.—p. 317.
32 Syndactylism. J. G. Edwards.—p. 319.
33 Case of Xanthoma Diabeticorum. N. Paul.—p. 320.

26. **Acute Renal Infection in Pregnancy and Puerperium.**—Ninety cases of renal infection occurring in pregnancy have been observed by Harris. Many of these were mild cases, and seen only on one occasion, the diagnosis being based on ordinary clinical methods. These cases were treated by advice and medicine, and were, as a rule, promptly lost sight of. Several were renal infections, dependent on causes other than the existing pregnancy, and were not true cases of pyelitis gravidarum. Thirty-two of the total number were more or less serious cases of pyelitis gravidarum. They were all subjected to careful cystoscopic examination, and treated by the retained ureteral catheter. The right kidney was involved in every case; in six both kidneys were affected. In no case was the left side alone affected. In the six bilateral cases the left kidney was infected after the right and to a less degree, as though it were a secondary and ascending infection. In every case of the thirty-two of the series a pure growth of *Bacillus coli-communis* was obtained from the catheterized urine from the renal pelvis, though in seven of the cases the bladder urine showed a mixed infection, with staphylococci in six and streptococci in one case.

These findings, Harris believes, warrant the two deductions that pyuria and pain confined to the left side are probably due to causes other than pyelitis gravidarum, and that pyuria

in pregnancy associated with other organisms in the renal pelvis than *B. coli-communis* probably owes its origin to some cause other than pyelitis gravidarum. In 18 of the 32 cases, ureteral obstruction was situated from 6 to 8 inches above the ureterovesical orifice, that is, either at or just above the level of the pelvic brim. In three of these 18 cases in which pyelo-ureterograms were made, the obstruction in all was seen to be about 1 to 2 inches above the brim. In two other cases some obstruction was encountered at the ureterovesical orifice. In the remaining 12 cases no obstruction was detected by the ureteral catheter, though in one case in which pyelography was performed, the ureter was seen to be dilated to within about 2 inches of the pelvic brim. Harris suggests that a tense psoas parvus tendon is a contributing cause of the ureteral obstruction, at any rate, in some of these cases.

29. **Etiology of Congenital Mental Deficiency.**—It appears from Lind's investigation of 317 cases that there are two causes of idiocy. The one is phylogenetic degeneration, and the other is disease or trauma of the brain in early life. Either cause can produce congenital mental deficiency, as this condition is now defined. Strictly speaking, the degenerative type only is congenital. Both types produce idiocy. In regard to the relationship of alcoholism to idiocy it is impossible to say with certainty from the evidence obtained during this investigation, whether the alcoholism is an indication of stock degeneration, or one of the causes which produce phyletic degeneration.

Sei-I-Kwai Medical Journal, Tokyo

October, XXXV, No. 10

34 Investigation of Diabetes Mellitus Among Japanese. S. Iwai. —p. 55. To be continued.

Archives des Maladies du Cœur, etc., Paris

October, IX, No. 10, pp. 425-472

35 Experimental Research on the Origin of Extrasystolic Arrhythmia. D. D. Pletnew (Moscow).—p. 425.

Bulletin de l'Académie de Médecine, Paris

October 10, LXXVI, No. 40, pp. 235-258

36 Arteriovenous Aneurysm of Femoral Artery. Quadruple Ligation with Resection of Intermediate Segment of the Vessels. Recovery; Two Cases. J. Boeckel.—p. 239.

37 Transfusion of Venous Blood by Siphon Technic. (Un procédé nouveau de transfusion du sang.) G. Blechmann.—p. 243.

38 Intratracheal General Anesthesia. (De l'anesthésie générale par l'intubation directe dans les opérations sur la tête et sur le cou.) Guisez.—p. 245.

39 *Spirochete Hemorrhagic Jaundice. (Trois cas de spirochétose ictérohémorragique en France.) L. Martin and A. Pettit.—p. 247.

40 Meningeal Symptoms in Relapsing Fever. (Le syndrome méningé au cours de la fièvre récurrente, see rapports avec l'augmentation de la pression du liquide céphalo-rachidien. Réaction méningée puriforme aseptique. Efficacité du traitement par le 606. Essai sur le traitement par l'electrargol et le mercure.) Petzetakis.—p. 253.

41 *Biologic Tests with Pus from Liver Abscess. (Pyodéviation du complément et abcès du foie.) L. Tribondeau and Fichet.—p. 256.

39. **Spirochete of Hemorrhagic Jaundice.**—The spirochete isolated and the syndrome produced by it seem to be identical with the *Spirochaeta icterohemorrhagiae* described recently by Inada and Ido. This hemorrhagic jaundice was encountered in a number of the soldiers, and its contagious nature is beyond question. The urine seems particularly liable to transmit the infection. Two guinea-pigs injected with 5 c.c. of urine from one patient died in seven and ten days, while those injected with blood from this same patient were not appreciably affected by it. The disease seems to have an incubation period of about seven days. The onset then is stormy. Serotherapy seems promising. Every case of febrile jaundice with relapses, with or without hemorrhages, should be regarded as an infectious disease. Infectious jaundice of a typhoid type was described by Landouzy and Lancereaux in 1882 and others in France before these, Larrey describing in Napoleon's day an "icteroid typhoid" similar in every respect to the spirochete disease.

41. **Biologic Test for Differentiation of Abscess in the Liver.**—Pus from an abscess in the liver is capable of inducing deviation of complement when used as an antigen in the biologic test applied to patients with liver disease. It is stated that pus from abscesses elsewhere does not possess this antigenic property. This pyodeviation has rendered good service in differential diagnosis of certain puzzling cases.

Lyon Médical, Lyons

October, CXXV, No. 10, pp. 417-464

42 Advantages of Turpentine Fixation Abscess in Treatment of Pneumonia. De Teyssier.—p. 417.

43 Sudden Death from Rupture of Latent Pedunculated Abscess in Interior of Fourth Ventricle. A. Espenel and J. Haour.—p. 423.

44 Suppurative Arthritis after Metallic Fixation of Compound Fracture; Two Cases. Aisopos.—p. 427.

Paris Médical

October 28, VI, No. 44, pp. 361-376

45 *Clinical and Bacteriologic Study of the Choleriform Enteritis at the Dardanelles. C. Richet, Jr.—p. 361.

46 Immediate Postoperative Treatment of War Fractures and of Wounds of Joints. R. Lataste.—p. 368.

47 Radioscopic Localization of Foreign Bodies. (Un nouveau procédé de localization radioscopique.) Laplaze.—p. 371.

48 Constriction of the Jaws and Its Mechanical Treatment. (La constriction des machoires et son traitement mécanothérapique.) J. Rouget and H. Chenet.—p. 373.

45. **Choleriform Enteritis in the Dardanelles Campaign.**—Richet was unable to find any special germ responsible for the choleriform enteritis that was common among the French troops during the first of the campaign. The only reliable means of differentiating it from actual cholera was the absence of cholera vibrios and the rapid recovery. There was not a case of true cholera in the whole expeditionary corps, and he ascribes this freedom from cholera to the vaccination against it and to the strict way in which hygienic measures were enforced.

Presse Médicale, Paris

October 23, XXIV, No. 59, pp. 469-480

49 *The Oculocardiac Reflex in Heart Disease. (Les modifications des bruits cardiaques sous l'influence de la compression oculaire dans les lésions organiques du coeur.) C. Laubry and P. Harvier. —p. 469.

50 *Anaphylaxis is a Reaction on the Part of the Nervous System. (Essai doctrinal sur l'anaphylaxie.) L.-C. Soula.—p. 471.

51 *Scraping Out Fistulas in Bones. (Cure radicale des fistules osseuses par l'évidement.) S. Mercadé.—p. 473.

52 *Technic for Preparing Surgical Hypochlorite Solutions. (Différence entre la solution de Dakin et celle de Labarraque.) M. Daufresne.—p. 474.

49. **The Oculocardiac Reflex in Heart Disease.**—Laubry and Harvier have been making a systematic study of the modification of the heart rhythm under the influence of pressure on the eyeball, and call attention to the way in which this affects the contraction of the heart. They describe seven cases in which the men suffered from palpitations and were unable to run or march for any length of time. Repeated examinations failed to disclose organic trouble, but under pressure on the eyeballs the heart rhythm changed to that typical of pronounced mitral stenosis. These changes in one case did not occur until the pressure had been kept up for two minutes, but in all the other cases they followed at once. The experiences related demonstrate that the oculocardiac reflex is a complex phenomenon. Besides the modification in the rhythm, the contraction of the heart muscle is directly influenced. These responses may be variable in different persons and in the same person at different times, but even allowing for this uncertainty, pressure on the eyeball may prove an important differentiating measure, eliciting symptoms that betray organic mischief otherwise impossible to detect.

50. **Nature of Anaphylaxis.**—Soula here reports the results of extensive research at the Physiologic Institute at the University of Toulouse on the nature of anaphylaxis. It showed among other things profound changes in the lipoid formula of the nerve centers in the course of the period of anaphylactic sensitization. Anaphylaxis appears to be a general phenomenon resulting from the action of the poison on the nervous system. The humoral reactions which have hitherto been considered primordial characteristics of anaphylaxis are pos-

sibly only the repercussion of the chemical upset in the nerve substance.

51. **Treatment of Fistulas in Bone Substance.**—Mercadé refers to fistulas that keep up interminably, refusing to heal through months. The trouble, he declares, is that they are treated too timidly. They should be enlarged to expose the whole cavity behind them, chiseling and gouging away the wall until we have an open cup or saucer-like cavity, cleared out into sound tissue on all sides. This cavity is rinsed out daily with weak hydrogen dioxid, rapidly dabbed dry and tamponed in such a way that the cavity can grow up from the depths toward the surface. With this single radical operation he succeeded in promptly curing his sixty-five patients with these rebellious fistulas into long bones.

52. **Preparation of Surgical Hypochlorite Solution.** — Daufresne is one of the workers at the hospital of the Rockefeller Institute at Compiègne, in charge of Carrel, and he gives the minute details for the preparation of Dakin's antiseptic fluid and for a modification of it which has been used at the hospital, instead of the original Dakin, during the last few months. He expatiates on the difference between the Dakin, Labarraque and javel formulas, and reports results of tests showing the difference of their action on phenophthalein and on the skin. To make 10 liters of the modified Dakin solution he weighs exactly 200 gm. of chlorinated lime (with 25 per cent. active chlorin by test); 100 gm. anhydrous sodium carbonate, and 80 gm. sodium bicarbonate. The 200 gm. chlorinated lime are placed in a 12 liter jar with 5 liters of ordinary water, shaking the whole thoroughly two or three times and setting it aside over night. In another jar the sodium carbonate and bicarbonate are dissolved cold in 5 other liters of water, and then the contents of this jar are poured at one gush into the jar containing the maceration of chlorinated lime. The whole is vigorously agitated for one minute and then set aside for the carbonate to settle. After half an hour, the clear fluid is siphoned off and filtered through two layers of paper. The limpid fluid thus obtained is then ready for use. It is kept in a cool place sheltered from the light. It should contain from 0.45 to 5 per cent. sodium hypochlorite with small amounts of neutral sodium salts. The solution is isotonic to the blood serum. The boric acid of Dakin's original solution has been dropped.

Each purchase of chlorinated lime is tested anew for the proportion of active chlorin, and if it is found below or above 25 per cent. the proportions of the three ingredients used must be altered to correspond, multiplying each of the three figures, 200, 100, 80, by the factor 25/N, N representing the active chlorin by weight in 100 gm. of the chlorinated lime. This proportion is determined by mixing 20 gm. with a liter of water and setting aside for several hours. To 10 c.c. of the limpid fluid, he adds 20 c.c. of a 10 per cent. solution of iodid, and 2 c.c. of acetic or hydrochloric acid, and then drops into the mixture, one drop at a time, a decinormal solution of sodium thiosulphate until decoloration ensues. The number of c.c. of thiosulphate used, multiplied by 1,775, gives the amount by weight, N, of the active chlorin in 100 gm. of the chlorinated lime. The chemical and biologic actions involved are described. See also Correspondence, p. 1687.

Revue de Chirurgie, Paris

May, XXXV, No. 5, pp. 637-780

53 *The Carrel-Dakin Method of Treating War Wounds and Burns. (Traitement des plaies de guerre par la méthode Carrel.) G. Hornus and P. Perrin.—p. 637.
54 Functional Reeducation of the Wounded. P. Régnier.—p. 668.
55 Extraction of Projectiles. S. Mercadé.—p. 697.
56 Extensive War Wounds. A. Chalier and R. Glénard.—p. 737. To be continued.
57 Operative Treatment of War Wounds of Nerves. A. Basset.—p. 754. Concluded.

53. **Carrel Treatment Applied to Burns.**—Hornus and Perrin reaffirm that the Carrel treatment has preeminent and multiple advantages. The results are constant when applied in the first six hours and the "mechanical cleansing" has been thorough and extensive; infection is throttled before it has a chance to develop. They say "The long periods of suppuration and serious infection of war wounds have disappeared forever. By the next day, by the sixth or eighth day at longest, the patient is in an excellent general state, in the best condition to repair his lesions. Recovery is more rapid, amputations become the exception, the wounded do not suffer, and pus is unknown." In one of three cases of extensive burns treated in this way, "the skin had completely healed over in less than a month, the new skin pink and supple, nothing at all like the hideous scars we are accustomed to see after such extensive burns."

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 14, XLVI, No. 42, pp. 1313-1440

58 *Surgical Experiences in the War. (Kriegschirurgische Erfahrungen.) F. Sauerbruch.—p. 1315.
59 *War Wounds of the Head. (Les blessures de guerre de la tête.) C. Julliard.—p. 1329.
60 *War Fractures of the Extremities. (Schussfrakturen der Extremitäten.) F. Steinmann.—p. 1359.
61 *War Wounds of the Joints. (Traitement des lésions de guerre des articulations.) Senn.—p. 1405.
62 War Wounds of Vessels and Nerves. (Kriegsverletzungen der Gefässe und Nerven.) E. Looser.—p. 1411.

October 21, No. 43, pp. 1441-1472

63 *Prevention of Contagion in Hospitals. (Die Verhütung der Uebertragung ansteckender Krankheiten in den Spitälern.) E. Feer.—p. 1441.
64 Infectious Erythema. J. Weber.—p. 1453.
65 Operative Treatment of Florid Bleeding Gastric Ulcer; Two Cases. (Zur Operationsindikation für das floride blutende Magengeschwür.) J. Kopp.—p. 1460.

58 to 61. **Surgical Experiences in the War.**—This large number of the *Correspondenz-Blatt* reproduces the addresses delivered recently at the third annual meeting of the Swiss Surgical Association. The speakers have all had a year or more of actual experience in tending the wounded. Sauerbruch emphasized the necessity for distinguishing between what is necessary and what is desirable, saying that the ability to do this is an art which has to be learned. He declared that war sugery is the same as peace surgery on a huge scale, and commented on the touching, childlike confidence of the wounded in their physicians. Julliard emphasized the advantages of covering extensive raw wounds with a layer of large-meshed silk tulle, dipped in liquid petrolatum. The gauze dressing is applied above this. This permitted free escape of secretions with no sticking to the wound. . . . Often men wounded in the head present surprisingly little disturbance. He saw one man walk into the hospital, smoking a cigarette, although he had had for two days a shrapnel ball several centimeters deep in the frontal lobe of the brain. In many cases a bullet in the upper jaw caused no disturbance for months.

Steinmann accompanies his remarks with forty-two illustrations. He has been much impressed by the frequency of severe suppuration after gunshot and shell fractures of the long bones. At times he had in his service at Bielitz a row of 130 men with suppurating fracture of the femur. He made great use of "open" treatment, exposing the wound to the sun and air, protecting the wound merely by a gauze-covered frame, like a huge muff.

Senn emphasizes the necessity for getting a wounded joint to a base hospital at the earliest possible moment, and having the same surgeon tend the lesion through all its phases. Otherwise the wound is liable to be treated in turn by different methods, as surgeons differ so widely in their views as to proper treatment of injured joints. Senn has witnessed irreparable harm result from this.

63. **Prevention of House Infection in Hospitals.**—Feer made a special study of this subject in preparation for erection of a new observation pavilion at the Zurich children's hospital. He visited the hospitals in Paris, Vienna, Berlin and Munich to learn what and what not to do, the history of many hospitals serving as intended and unintentional mass experiments in many instances. There were no hospitals especially for children until 1802 when the Hôpital des enfants malades was founded at Paris. Petrograd followed with one in 1834, Vienna and Berlin soon falling into line. In Switzerland they date only from 1862 and 1874. After thus studying on the spot the Lesage and Grancher cubicles and the other methods in vogue, in the chief medical centers, Feer had his

new observation station built with a capacity equal to one-fifth of the total capacity of the hospital. Recognized scarlet fever and diphtheria patients are taken at once to the special wards for these diseases, and grippe patients also are not taken into the observation station. The system of isolation selected is that used in the Pasteur Institute at Paris, entirely separate rooms, 2 by 4½ meters, with glass walls; each faces south, with a large window. The window of each room can be shut from without, and this is done before opening the door, to prevent any draft through in case volatile infections, such as measles and varicella, are suspected. The building has two stories with separate stairways. In the second story there is a hall for convalescents. During the three months the station has been in use, it has sheltered simultaneously measles, varicella, whooping cough, diphtheria and scarlet fever, and the rooms have been used for one after the other. No infection can occur, he is confident, if directions are followed. The new station lifts a tremendous load of responsibility from the shoulders of the hospital chief.

Deutsche medizinische Wochenschrift, Berlin

October 5, XLII, No. 40, pp. 1213-1244

66 *Indigo-Forming Substances in the Urine, Their Decomposition by Bacteria, and Indigurie. (Ueber indigobildende Substanzen in Urin—Harnindikan—ihre bakterielle Zersetzung und Indigurie.) G. Hoppe-Seyler.—p. 1213.

67 *Negative Widal and Negative Typhoid Bacilli Findings the Rule in Typhus. (Ueber die Brauchbarkeit der bakteriologischen Typhusdiagnostik zur Differentialdiagnose zwischen Fleckfieber und Typhus.) Meinicke.—p. 1214.

68 *"Five-Day Fever." (Zur Kenntnis der Febris wolhynica.) R. Korbsch.—p. 1217.

69 Benign and Malignant Sclerosis of the Kidney. (Zur Klinik der "vaskulären Schrumpfniere.") H. Machwitz and M. Rosenberg. —p. 1219. To be continued.

70 Radiotherapy in Treatment of Uterine Hemorrhage and Myoma. (Weitere Erfahrungen über die konservative Behandlung der Uterusblutungen und Myome mit Mesothorium-Radium.) A. Pinkuss.—p. 1222.

71 Localization of Foreign Bodies. (Fremdkörperlokalisation oder Tiefenbestimmung?) Eisenlohr.—p. 1226.

72 Why is Peroneal Paralysis More Common than Tibial? S. Auerbach.—p. 1228.

73 Spring Shoes for Litter Legs. (Eine neue federnde Lagerungsvorrichtung für Krankentragen auf Fahrzeugen aller Art.) Flemming.—p. 1230.

74 Free Treatment of Venereal Disease; Who Should Bear the Expense? (Die Behandlung geschlechtskranker Kriegsteilnehmer und ihre Honorierung.) H. Schönheimer.—p. 1232.

66. **Urine Indican.**—Hoppe-Seyler has succeeded in isolating potassium indoxyl-sulphate from the urine of a patient with intestinal tuberculosis. It conformed to all the tests, and it is thus fully established, he asserts, that the indican of human urine consists mainly of indoxyl-sulphate. Urine containing indoxyl is altered by bacterial action in the presence of oxygen, mostly by strains of colon bacilli. This causes a splitting of the indoxyl and the urine turns blue or brownish. Urine rich in aromatic compounds is not a good culture medium for bacilli. In quantitative tests for the ethereal sulphates and indoxyl, bacterial decomposition must be avoided.

67. **Differentiation of Typhoid and Typhus.**—Meinicke comments on the difficulty of distinguishing between these diseases, saying that many cases of typhoid were sent to the typhus ward. Without close study of the cases there would have been a blunder in the diagnosis in 25 per cent. of the 201 cases; 157 proved to be typhus and 44 typhoid. In the true typhus cases the Widal reaction was constantly negative and no typhoid bacilli were ever found in the blood. Most of the men had been vaccinated against typhoid but only once and this long before.

68. **"Five-Day Fever."**—Korbsch reports further experiences of the disease which His described last spring as a new war disease, calling it Febris wolhynica; Werner calls it "five-day fever." Korbsch emphasizes its resemblance to relapsing fever, both in its symptoms and its yielding to arsenic preparations. The onset is stormy and sudden; the pains in the bones become almost unbearable in a few hours. They grow gradually less severe, and disappear completely with the terminal sweating. The Widal reaction is 1:400 or 1:800 at first but drops until by the end of the second week it is only 1:100 or below. The disease occurs in attacks, each lasting one, two or three days; then follow two afebrile days, and the patient thinks he is well again, when another attack prostrates him. In 90 per cent. of the cases the spleen became enlarged by the second attack. The fever chart shows a single high peak, returning the fifth day, unless the second attack is rendered abortive by arsenic treatment. Diarrhea during the first attack was pronounced in 14 per cent. and less marked in 22 per cent. Heart complications are common; in 8 per cent. the left heart became dilated, and the heart sounds in all the patients became faint and blurred. The pulse was unstable and with low pressure, but no serious permanent damage seems to have resulted. A granulated spirochete was found in the blood of three of the patients but only in these. Body lice were on all these patients and there were no winged insects at this season. The disease affected exclusively the men of single troops; no isolated cases occurred among the other troops, and no house infection developed after thorough "unlousing" of the premises. One man developed the disease without direct contact with the sick, merely after cleaning the vehicle in which they had been transported. For these and other reasons cited, the louse is under suspicion. In a few cases the disease occurred in such a mild form and the attack was so transient that the men did not report themselves as sick. This may explain certain cases of puzzling contagion.

Münchener medizinische Wochenschrift, Munich

September 26, LXIII, No. 39, pp. 1381-1412

75 *Cultivation of the Rickettsia Prowazeki, the Alleged Typhus Germ. (Untersuchungen über Fleckfieber.) H. da Rocha-Lima.—p. 1381.

76 *Analysis of the Electrocardiogram Observed in Case of Paroxysmal Auricular Tachycardia. H. Straub.—p. 1384.

77 Powder Treatment of Vagina. (Kohlensäurewundpulver zur vaginalen Pulverbehandlung.) F. Mendel.—p. 1386.

78 Procedure for Restoring Agar So It Can Be Used More Than Once. (Erneuerungsverfahren für gebrauchte Agarnährböden.) P. Kuhn and M. Jost.—p. 1388.

79 Ultraviolet Rays plus Chemical Sensitization to Sterilize the Throat of Diphtheria Bacilli Carriers. (Bazillenträger, ihre Entstehung und Bekämpfung.) E. Friedberger.—p. 1389; (Entgegnung.) Rolly.—p. 1390.

80 Prevention of Stiff Shoulder. (Die Versteifung des Schultergelenkes durch Hängenlassen des Armes.) B. Riedel.—p. 1397.

81 Quinin in Prophylaxis and Treatment of Malaria. (Ueber Malariagefahren und ihre Verhütung durch Chininprophylaxe und Chininbehandlung.) P. Mühlens.—p. 1398.

82 Marmot Complement for Wassermann Test. (Hamsterkomplement an Stelle von Meerschweinchenkomplement bei der Wassermannschen Luesreaktion.) A. Reinhardt and H. Oeller.—p. 1399.

83 Testing for Hemeralopia. (Zur Praxis der Lichtsinnprüfung.) Braunschweig.—p. 1400.

84 Open Treatment of Wounds. (Ueber offene Wundbehandlung und eine Behandlungsschiene für die untere Extremität.) Braun. —p. 1402.

85 Restoration of Function in Ten Days after Radial Nerve was Severed by Bullet. (Durchschuss des Nervus radialis. Völlige Funktionsherstellung in 10 Tagen.) A. Löwenstein.—p. 1405.

86 Injury from Being Buried Under Debris. (Kasuistisches über Verletzungen durch Verschüttungen.) Orth.—p. 1406.

87 *Making Fingers out of the Hand after Loss of All the Fingers. (Mittelhandfinger.) O. Burkard.—p. 1409.

88 Devices to Correct Contracture and Paralysis. (Einfacher Apparat für Peroneuslähmungen.) E. Schmid.—p. 1409; (Ein neuer Finger-Beuge-, Streck- und Spreizapparat.) Kröber.—p. 1410.

75. **Etiology of Typhus.**—Rocha-Lima of the Institut für Schiffs- und Tropenkrankheiten, regards as extremely important the discovery that the micro-organisms found in lice that have bitten typhus patients, penetrate into the epithelial cells of the digestive tract of the louse and multiply there, causing profound and characteristic changes in the cells thus affected. Nothing resembling these changes was found in 120 normal lice examined, and these changes, he reiterates, are peculiar to the Rickettsia and identify it. The micro-organism, he says, is probably identical with some of those described by Ricketts and Wilder, Prowazek, Sergent, Foley and Viallette. It is not certain that it is a bacterium and hence, to be safe, he calls it the *Rickettsia prowazeki*. He does not regard the Plotz bacillus as responsible for typhus, for reasons which he enumerates. The special features of the Rickettsia are its intracellular development; the regular experimental infection of lice with the Rickettsia when they are allowed to bite typhus patients—and exclusively under

these conditions; and the parallelism between the Rickettsia infection of the lice and the infectiousness of the lice for guinea-pigs—these features justify, he says, the assumption that this is the causal agent of typhus.

He describes his extensive research in detail, and notes among other results obtained that typhus does not develop "carriers." In about 100 tests on convalescents the findings were constantly negative. The tests were made by buckling on the arm or leg a Sikora louse cage, containing from 25 to 50 lice from a typhus-free region or raised in the laboratory. The cage is left on permanently or applied for an hour or two daily, keeping this up for about ten days. His research further demonstrated that it is possible for the louse to transmit the Rickettsia to its young, but that this is of exceptional occurrence. It occurred once in thirteen tests. Biting a typhus patient once is enough to infect the louse, but the virus disappears early from the patient's blood after defervescence.

76. **Nature of the Electrocardiogram.**—Straub reports a case of paroxysmal auricular tachycardia in which during the attack the electrocardiogram was modified in a way which strongly suggests that the latter consists of two quite different peaks, those of the R group and of the T group. He explains this in detail, as he calls attention to the shortening of the ventricle electrocardiogram to less than two thirds in the course of the attack of auricular tachycardia.

87. **Rebuilding a Hand.**—Burkard's patient had lost from freezing all the fingers and thumb of the right hand. It looked like a square mitten without a thumb. He cut down between the fingers and succeeded in building up in this way three finger-like stumps and a thumb stump, all made from the bones of the metacarpus, all covered with sound skin, and able to grasp effectually the handles of tools, etc.

Fingers Made from Metacarpus.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 15, XXXVII, No. 83, pp. 1297-1312

89 Case of Mumps Meningitis in Boy of Fourteen; Recovery. (Caso di meningite da orecchioni.) D. Vandini.—p. 1300.

October 19, No. 84, pp. 1313-1328

90 Herpes Zoster Consecutive to Vaccination against Typhoid. B. Nicola.—p. 1315.

Russkiy Vrach, Petrograd

XV, No. 37, pp. 865-888

91 *The Vasomotor Reflexes in the Skin. (Sosudodvigatelnie reflexi kozhi.) P. V. Nikolsky.—p. 865.

92 Vaccination against Typhoid and Paratyphoid. (Opit primieneniya smieshannoi typhozno-paratyphozno vaktsini.) S. N. Predtechensky.—p. 868; (Iz nabliudeni nad immunizatsiei protiv briushnogo typha.) A. F. Pieshekhonova.—p. 870; (K voprosu ob opredielenii stepeni temperaturnoi reaktsie pri privivkakh typhoznoi vaktsini.) X. D. Arkhepiants.—p. 872; Do. —— p. 874.

93 Case of Generalized Sporotrichosis Over Entire Body. (Sluchai videleniya sporotrichum Gougerot ot bolnoi.) V. E. and A. E. Burovi.

94 Closing Cavities in Bones after War Wounds. (K. voprosu o zaktritii kostnikh polostei poslie ognest. perelomov.) S. A. Novotielnoff.—p. 878. Concluded.

95 *Treatment of Cancer. (O liechenii raka.) A. D. Nurenberg.—p. 883.

91. **Dermographism.**—Nikolsky comments on the lack of discrimination in the textbooks between red and white dermographism. Drawing a spatula or the fingernail along the skin may cause the production of a red line along the path of this mechanical irritation, or a line of whiteness may be observed. The white line is particularly striking when it occurs on an area of skin already reddened by inflammation or sunburn. He expatiates on the antagonistic mechanism of these reflexes, and the importance of heeding this mechanism in treatment of skin affections. The red line indicates excessive irritability on the part of the vasodilating nerves, while the white line indicates a spasm of the vasoconstricting nerves. The reflexes may occur in different intensity on the trunk and on the extremities of the same patient, and they may differ likewise on the inflamed and sound skin of the same patient. The absence of any reaction is also instructive in certain skin diseases, and likewise the changes in the reflex under the influence of therapeutic measures. As hyperemia may occur from dilatation of the vessels under the action of unduly irritable vasodilator nerves, or it may occur from paralysis of the vasoconstricting nerves, the skin reflex will reveal which of these mechanisms is responsible. This will enable us to apply sedative or stimulating remedies as indicated, and places treatment on a scientific basis instead of on mere empiricism. If a person with white dermographism has the skin rubbed to induce hyperemia from the friction, and then the test for the skin reflex causes no white line to appear on the reddened area, we can assume a paralyzed condition of the vasocontrictor nerves. The friction upsets the unstable balance of the vasoconstrictors, and the hyperemia induced is of the paralytic type. This may occur likewise from the action of the mercury vapor lamp and of carbonated baths.

95. **Stimulating Leukocytolysis in Treatment of Cancer.**—To aid and sustain Nature in the struggle against invading infections is the aim of therapeutics, and the study of Nature's methods of defence has convinced Manukhin that the leukocytes are the main reliance. By destruction of the leukocytes their antibodies are liberated, while Nature hastens to replace those destroyed and increases the numbers of the mobilized army of leukocytes. During the last three years Manukhin has insisted that by artificially stimulating leukocytolysis we are reenforcing Nature's efforts in the most direct and effectual way. He seeks to accomplish this by applying small doses of Roentgen rays to the spleen. The exposure is equal to only 1 or 1.25 H units after filtering through 1 mm. aluminum. He obtains this dose in the course of four or five minutes with a current of 1 ma and 5 or 7 a, with the hardness of the tube equivalent to a Benoist 8 or Wehnelt 10 at a distance from the surface of about 25 cm. His detailed communication on the subject appeared in *Vrach*, 1916, Nos. 22-26, in which he reported success in whatever infectious disease the organism was contending with at the time. He remarks in conclusion that the constancy of the success (1913) in aiding monkeys to throw off infection from virulent tubercle bacilli cultures justified the application of the measure in the clinic, and he regards the results as extremely encouraging.

In this preliminary communication Nurenberg reports the application of the principle to the treatment of cancer. He reviews what Ribbert and others have published on the influencing malignant disease by modifying the lymphatic system. Ribbert found in his study of gland metastases of cancer of the lip that the invading cancer cells did not seem to be destroyed by anything in the nature of phagocytosis so much as by the toxic influence from chemical substances escaping from the disintegrating lymphocytes.

Thus his research confirmed Manukhin's views as to the importance of leukocytolysis in Nature's efforts to throw off disease. Nurenberg emphasizes further the rarity of invasion of the spleen by malignant disease, saying that Brancati found that tumors which could be successfully grafted into other organs never gave any growth when implanted in the spleen. Apolant has also reported that splenectomy reduces the defensive powers of mice against tumor grafts, and this has been confirmed by Brancati, Oser and Pribram. Biach and Welt-

mann implanted simultaneously tumor tissue and spleen tissue and found that the mice or rats thus grafted displayed greater resistance to the development of cancer than normal animals, confirmed further by others. Other investigators have reported even retrogression of tumor grafts. Most of these authors explain these phenomena as resulting from the stimulation of the production in the spleen of cytolytic antibodies. Nurenberg presents further evidence to show that the lymphatic glands can be ranked with the spleen as regards leukocytolytic action. It may be possible therefore to imitate and reenforce Nature's efforts at a spontaneous cure by Roentgen exposures of the spleen by Manukhin's technic or by exposures of lymphatic glands to the ultraviolet rays.

Hospitalstidende, Copenhagen

November 1, LIX, No. 44, pp. 1061-1084

96 *Mode of Invasion and of Spread of Tuberculosis in the Female Genital Organs. (Om Indgangsport og Udbredningsmaade af Tuberkulosen i det kvindelige Genitalsystem.) I. P. Hartmann. —p. 1061. Commenced in No. 42, p. 1037.

96. **Tuberculosis of Female Internal Genital Organs.**—Hartmann's long article discusses the mode of entry of the tubercle bacilli into the internal genital organs, reviewing the literature on the subject and comparing clinical findings with the results of considerable personal research on guinea-pigs. He injected tubercle bacilli into the vagina of the guinea-pigs or into the cornua of the uterus. All the data presented apparently disprove the possibility of ascent of tubercle bacilli against the course of the secretions. Even when implanted in a cornu of the uterus, the tuberculosis always spread in the distal direction.

Ugeskrift for Læger, Copenhagen

October 16, LXXVIII, No. 42, pp. 1799-1898. Bartholin Tercentennial Number

97 *The Tercentennial Address on Thomas Bartholin 1616-1916. V. Maar.—p. 1799.

98 Bartholin as Anatomist, as Peer, as Antiquarian and as Poet. (Et Blad af Domus Anatomicas Historie.) V. Maar.—p. 1812; (Bartholin og Oldforskningen i Danmark i det 17. Aarhundrede.) C. Neergaard.—p. 1836; (De adelige Bartholin'er.) A. Thiset.—p. 1878; (Bartholinerne som Adelsmænd og Jordegodsbesiddere.) C. T. Bartholin.—p.1887; (Bartholin som Digter.) O. Andrup.—p 1891.

99 Bartholin's Correspondence. (Et Hyldningsdigt til Th. Bartholin fra Vitus Bering.) C. E. van Leersum.—p. 1818; (Nogle Breve fra Thomas Bartholin til Ole Worm.) J. W. S. Johnsson. p. 1820; (Et Taksebrev fra Thomas Bartholin.) A. Garboe. —p. 1872.

100 Portraits and Memorials of Bartholin. O. Andrup.—p. 1852; V. Maar.—p. 1867; A. Garboe.—p. 1876.

101 Bartholin's Family and Descendants. (Bartholinerslægten.) K. Garboe.—p. 1880

97. **The Bartholin Tercentennial.**—This well illustrated issue of the *Ugeskrift* is devoted to this Danish anatomist of the seventeenth century, and the tercentennial celebration, October 20. The current number of *Janus* is also devoted to commemoration of this early anatomist.

Upsala Läkareförenings Förhandlingar

XXI, No. 6-7, pp. 399-579. Last indexed April 8, p. 1174

102 *Spontaneous Pneumothorax Complicating Artificial Pneumothorax. A. Wallgren.—p. 399.

103 *Development of the Disposition of the Intestines in Human Embryos. (Om tarmlägets utveckling hos människofostret.) G. Ekehorn.—p. 433.

104 *Involvement of the Ovaries in Mumps. (Om oophorit som komplikation till den epidemiska parotiten.) C. D. Josephson.—p. 523.

105 *Postoperative Parotitis. C. D. Josephson.—p. 563.

102. **Spontaneous Pneumothorax Complicating Artificially Induced Pneumothorax.**—Wallgren has had this mishap occur in two cases and has come to regard it as liable to be a very serious complication. In one of his cases it happened twice; the first time from injury by the puncture needle. The second time it occurred three days after the repeated insufflation; evidently the lung tissue had given way to the traction from some linear adhesion. There was no serious damage from either in this case. In the second case the symptoms of the spontaneous pneumothorax did not become evident until eight hours after the insufflation. The tuberculous process in this case soon spread disastrously to the other side. In a third case cited the tuberculosis was of four years' standing. Both lungs were affected but the disease seemed to be stationary on one side. This encouraged the inducing of artificial pneumothorax, but spontaneous pneumothorax complicated the therapeutic, causing considerable disturbance, cough, etc. The patient survived this but died a month later from the progressive pulmonary processes. In connection with these cases Wallgren summarizes seven others from the literature, with over two pages of bibliography. In prevention, he says, it is wise to have the needle graduated so that we can know how deep we are pushing it in. It should be introduced very cautiously, warning the patient to breathe lightly. The tip should not be sharp and it should be inserted at a point where we believe the lung tissue to be as free from changes as possible, keeping remote from the region where a cavity is suspected. The spontaneous pneumothorax can occur from the progress of the destructive process, from trauma or from traction on a weak part of the lung, or from perforation into lung tissue of a pleural empyema complicating the artificial pneumothorax.

103. **Study of Embryonal Development of the Position of the Intestines.**—Ekehorn's long study of this subject is accompanied with four fine plates containing forty-nine illustrations.

104. **Involvement of the Ovaries in Mumps.**—Josephson reports the case of a woman of 38 previously healthy, except for sciatica two years before, who passed through an ordinary attack of mumps during an epidemic. Her four children did not contract the disease. After subsidence of the swelling of the parotid glands, the woman's temperature kept high but tests for typhoid were negative, and the temperature finally dropped to normal. The twentieth day after the first symptoms intermittent pains developed in the right and left sides of the abdomen alternately. This was assumed to be a complication of the mumps as the uterine adnexa could be palpated, much enlarged, the left as big as a lemon. Under conservative measures and bed rest, conditions returned apparently to normal by the end of two months. After two months of freedom from symptoms the pains in the right abdomen returned, with much discharge and lassitude. A laparotomy revealed the left adnexa apparently sound, but the right were suppurating, with adhesions, and cystic degeneration as he describes with illustrations. Tuberculosis, gonorrhea and appendicitis could apparently be excluded. A diplococcus was found in the pus which possibly may be identical with the one described by Laveran and Catrin in 1893. Comparing this case with a dozen similar ones which he summarizes from the literature, demonstrates, he declares, that we must regard mumps as a general infectious disease which is liable to attack almost any of the glands, and even the kidneys, pancreas, thymus, thyroid and lacrimal glands. As a rule the testicles bear the brunt of the attack, outside of the parotid glands, but the ovaries and the mammary glands come next in frequency. He knows of only one rather dubious case, beside the one here reported, in which the ovaries developed a suppurative process with rapid sclerocystic degeneration.

105. **Postoperative Parotitis.**—Josephson analyzes the literature on parotitis developing after an operation. It seems to be more common than generally recognized, and may develop after almost any kind of a major operation requiring long anesthesia. There seems to be an undoubted connection between the salivary and the genital glands, at least in the line of inhibiting secretion. This renders the inhibited gland less resistant and this seems to be the only possible explanation for the exceptional frequency of postoperative parotitis after operations on the ovaries. He says it has scarcely ever been observed after myoma operations, removal of inflamed tubes, vaginal hysterectomies or prolapse operations. Even with bilateral ovarian tumors the patient may continue to menstruate regularly, showing that some ovarian tissue is still functioning. The sudden removal of this functioning ovarian tissue may upset the balance in the internal secretions, the salivary glands suffering particularly, and parotitis follows. Among the authorities cited is von Hertzen who reported in 1912 or 1913 twelve cases of postoperative parotitis.